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May \$3*

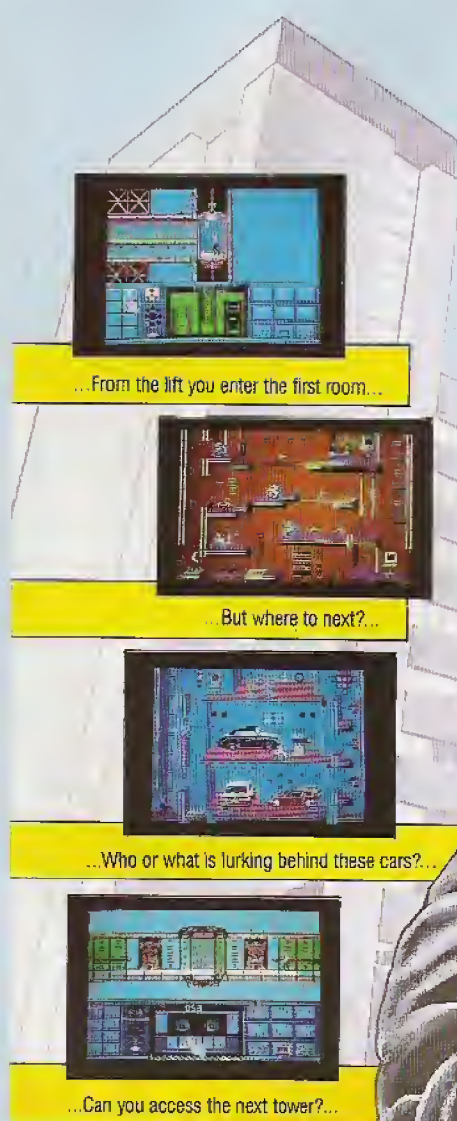
The Australian **COMMODORE** and **AMIGA REVIEW**

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Hi-res on the 128
Packet Radio
Paperclip III

Amiga
Games

Amiga
Acquisition
update



Impossible Mission II

Amiga CLI

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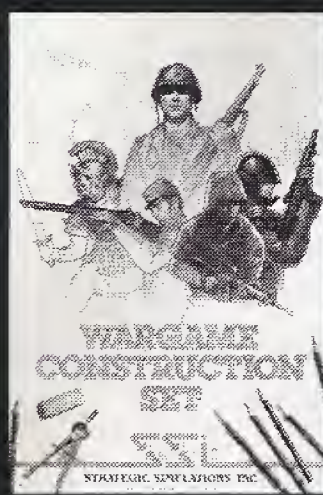
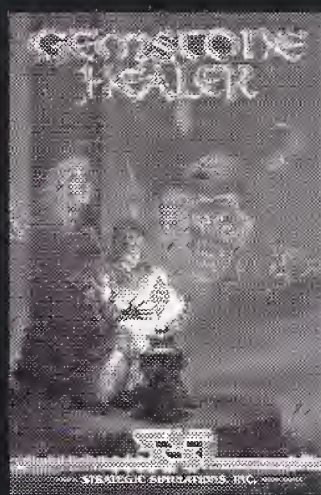
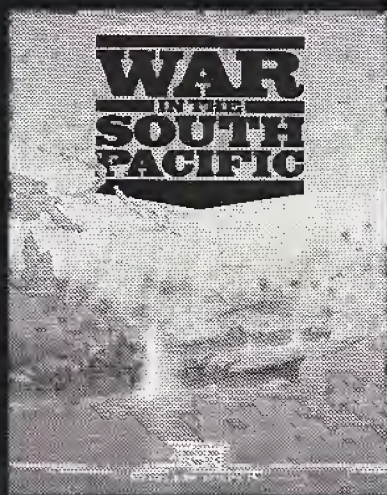
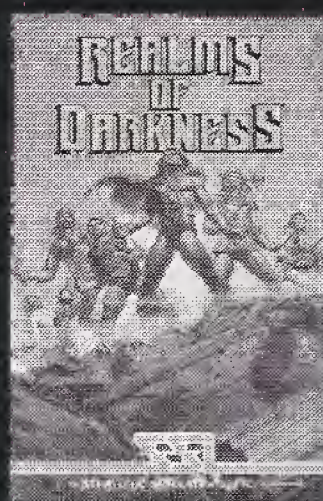
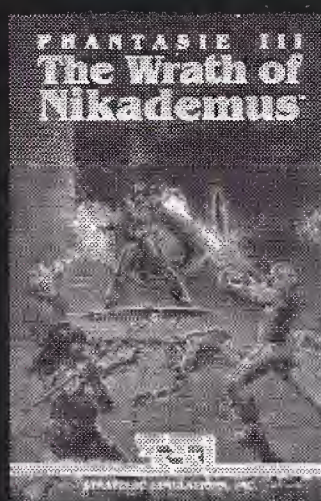
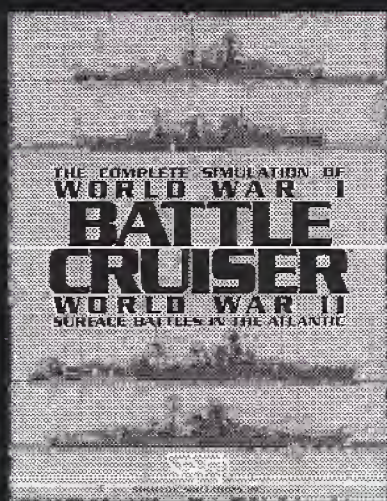
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The Australian Commodore and Amiga Review

Vol 5 No 5 May 1988

CONTENTS

FEATURES

- 8. **Impossible Mission II** - the best features of the old and new ideas and challenges
- 10. **Bit mapped graphics on the 128's 80 column screen** - high resolution graphics might have real potential ...
- 18. **Packet Radio** - the C64 is one of the best machines for this

SOFTWARE

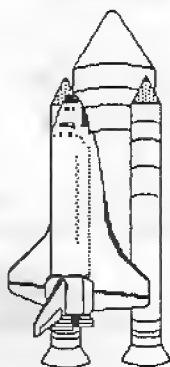
- 16. **PaperClip III** - a improvement over other C64 word processors
- 20. **Becker BASIC** - a very much enhanced BASIC for the 64

GAMES

- 32. **Morpheus** - a long term game - a game that you can return to
- 34. **POKEs for almost everything**

PROGRAMMING

- 40. **Machine Code Tutorial Part 6**
- 31. **Hints and tips** - Perma Colour



AMIGA REVIEW

between pages 24 and 25

HARDWARE

- 38. **Light Pen** - just point at the screen to draw
- 4. **The Icontroller** - use instead of a mouse or joystick

GENERAL

- 25. **Beginners start here!** - a guide to all the jargon you'll run into - especially written for beginners.
- 24. **Crossword**

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REGULAR APPEARANCES

- 2. **Editorial**
- 3. **Ram Rumblings**
- 6. **Letters**
- 43. **Adventurer's Realm**

Editorial

Whilst Don Lane, Graham Kennedy and Clive Robertson continue to battle the ratings stakes, it seems the fight between the big A's is well and truly over. And the winner is beyond doubt the Amiga. Despite initial predictions by some members of the computer fraternity, Amiga has now gained a strong foothold in the European and American markets, after a slightly sluggish start.

Atari has faded into obscurity, although still returning a healthy profit through sales of their Video Games Console. In Australia, the ST failed to make a significant impact, despite the promises of eager management, and enthusiastic dealers.

Amstrad left the race when the 68000 machines entered the fray. Even the Ap-

ple Macintosh Plus is slowly losing grip on the home market as Amiga gains acceptance as a real alternative to this pricey but more experienced machine. It seems the monochrome tones and tiny screen are no match for the brilliant colours and soothing melody of "Only Amiga..!"

The Macintosh colour alternative is way out of touch with the buying power of computer shoppers. However, congratulations are in order to the Mac II, after winning the Your Computer of the Year award.

Most amazingly, there is no longer so much as an inch of competition for the legendary Commodore 64. Recommending an inexpensive home computer to friends is now a breeze. It's no longer



a matter of which brand, but what model. A C64, C128 or A500, or A2000 or maybe you should wait for the new machines!

Personally, I think Clive Robertson has got it well and truly sewn up. ■

Andrew Farrell

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Ram rumbles

Apple II forever? Never!

IT AMAZES US to hear there are still Apple pundits who cry "Apple II Forever!". We think they're a few bits short of a byte. The Apple II line continues to lose ground to the Macintosh, whilst the trusty C64 powers on, seemingly forever.

Commodore officials assure us that during Christmas, the C64's weren't even being warehoused in the USA. They just rolled straight off the assembly line, and into the back of a waiting truck. I wonder if they tested them first?

Meanwhile back at the laboratory, rumours continue to abound of a new C64. These rumours have arrived in dribs and drabs for the past year, and it may just be a market research ploy to test consumer reaction. Well, here's my reaction . . . Build the dam thing!

According to the non-existent spec sheets, the new model will power along with speedup ROMs driving a built in 1581 disk drive. Now that may or may not be a mistake, depending on third party software houses reaction. My guess is they'll ignore the new 3 1/2 inch format unless it sell big numbers. And of course, it won't sell big numbers unless there is plenty of third party software.

For a sure fire look at this new machine, if it exists, we'll be sending spies to the Summer CES show in Chicago, USA. ■

Commodore International posts a profit

COMMODORE INTERNATIONAL has announced a 15% increase in sales revenue for the third quarter of the 87/88 fiscal year. Irving Gould, CEO and Company Chairman said "This increase follows sales revenues of A\$226 million for

the corresponding period last year."

In Australia Commodore reported sales revenue reached A\$23 million, a rise of 52% over the same period last year. Hey guys, we're impressed! Tony Serra, the man at the helm, said, "Aggressive marketing and large sales of Commodore's A500, PC10 and 20 have been responsible...". Of course we know that it was really due to such brilliant support from Australia's only Commodore magazine!

Mr Serra is keen on being a \$100 million company, and the current figures place Commodore in line to reach that goal. Does this mean more free lunches for us overworked journo's? ■

New from Electronic Arts

SEVERAL new applications and game programs have been released by Electronics Arts.

● **PaperClip Publisher** for the Commodore 64/128 is a desktop publishing program. It can be used to create any printed piece, even folded greeting cards, that uses words and pictures.

"It is an entirely self-sufficient package containing all the text formatting, layout, and design power Commodore owners need to publish documents," said Stewart Bonn, vice president of Electronics Arts Creativity Division.

It will support documents of up to 50 pages. Special features include the ability to work outside a given document, temporarily holding text and graphics; a refreshing feature which automatically updates an altered part of a document; the ability to move articles from page to page; and a WYSIWYG feature.

Distributed by ECP (075) 96 3488, no price available yet.

Update



Well, this column is going to be missing from next month's magazine because yours truly will be overseas visiting four exhibitions. The Comdex Exhibition in Atlanta, Georgia, the Commodore Exhibition in London, the Amstrad Exhibition also in London, and the Computer Show in Taiwan. Do I hear someone saying what a lucky fella?

Let me tell you that walking around conference halls that make Darling Harbour look like a small living room is no fun at all.

However, it is well worth it because I am sure that I will find a whole range of new products for the 64, Amigas and PC Compatibles, so don't miss this column in the issue after next which should be the July issue.

While I come back I will be announcing a competition in this column for those of you who can give me the wording for all my silly initial endings since I started my column in the *Commodore Review* in October, 1987 (Vol 4 No 10).

The prize will be \$100 worth of software so keep watching for details.

BBUICB

● **Wasteland**, a futuristic role playing game, is set in the southwestern deserts of the U.S. and challenges players to survive in the post-nuclear, radioactive year of 2087.

Wasteland is based in the year 1998 when tensions mount between the U.S. and Soviet Union. You are working in the desert on the fateful day when the world's satellites are swept clean from the planet, leaving the great powers of the world blind from each other. In a panic, each send 90 percent of their nuclear arsenals skyward.

You seek shelter in a nearby federal prison, from which grows Ranger Center and the famed Desert Rangers whose objective is to help other survivors rebuild and live in peace and to protect the population from mutant villains who wander the deserts.

This will soon be released for Commodore 64 and 128 computers, distributed by ECP (075) 96 3488, no price available yet.

able yet.

● **Word Problems** from Gamco is a two-disk program. The first disk develops prerequisite math word problem skills. Three lessons on disk 1 include choosing the correct operation, identifying reasonable answers, and deciding if there is too much or too little information.

Four lessons on disk 2 cover solving one-step problems, multiple-step problems, solving problems when extra information is given, and a review of all skills.

The computational levels are adding or subtracting whole numbers up to five digits, multiplying or dividing by one-digit or two-digit numbers, adding or subtracting numbers with one or two decimal places, and multiplying or dividing decimals with one or two non-zero decimal places.

This will be distributed by ECP but is not yet in stock. ■

Micro Accessories of SA

WE ARE INFORMED by the agents of the mortgagees in possession that this company has ceased trading.

The agents are Sheahan Sims, Chartered Accountants, Level 5, ANZ House, 13 Grenfell St, Adelaide, SA 5000, telephone (08) 321 9077.

If you are looking to buy the products Micro Accessories of SA used to distribute:

Cockroach Graphics Utility and Cockroach Turbo Rom can be obtained from Cockroach Software, PO Box 1154, Southport 4215 (075) 324 028 (see advertisement this issue).

Dolphin Dos can be obtained from MicroComputer Spot stores and by mail order from them, 13 Gibbes St, Chatswood, NSW 2067 (see advertisement in the Amiga section of this magazine). ■

The Icontroller

by Eric Holroyd

THIS CLEVERLY-NAMED gadget is really a miniature joystick type control which fits onto the bottom right hand corner of your C64 or C128 keyboard (it also suits Atari 800XL and 520ST). It's designed to be used instead of a mouse or joystick on "point and click" software. It's quite unobtrusive when in place, but at the same time it's very well situated for using with painting and drawing programs, programs with pull-down menus, and of course when working with the excellent GEOS.

The illustration shows how the unit fits to the keyboard and it's even moulded in a similar coloured plastic to the 64/

128 so as to blend in. You'll see how the cable fits alongside the keyboard to allow the plug to fit in Port 1. It's a great idea, a "piggy-back" plug which allows you to leave it in place permanently and plug in a regular joystick straight through it. Terrific.

Icontroller is better than a mouse for GEOS if you have limited deskspace as you don't need any room to roll a mouse around, just use the fingertip control to position the pointer on screen, touch the button to "click" and the selected icon's file starts to load. Likewise if your program has a pull-down menu. Operate the control without your hand leaving the

keyboard area, a flick of the little finger does the job.

When using painting programs which normally use a joystick you'll find that Icontroller lets you work more precisely, with better control of the cursor so that you don't "oversteer". It's made by Suncom, who already make good joysticks as well as the Animation Station graphics tablet so they know what they're about when it comes to working on screen.

Icontroller is meant to be used with C64 and C128 keyboards and wasn't really designed to use with the C128D (which has only just been released in the USA anyway), but I secured the unit to the right hand front corner of my C-128D unit (just above the disk drive) so as to be able to plug in to Port 1 and it worked fine. Only difference is that I have to reach forward to operate it instead of just to the right if using a normal C-128 or C-64. I liked the unit a lot and recommend it wholeheartedly.

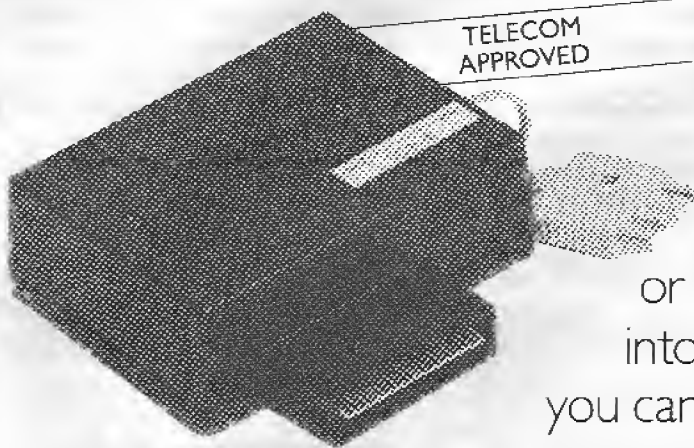
The Icontroller is distributed by Computermate at \$45 RRP. ■



Great for pull-down menus

As a digital joystick equivalent, Icontroller performs superbly with many graphics-based programs calling for joystick input. Control of pull-down menu options is executed with a flick of the finger - much more efficiently and quickly than removing your hand from the keyboard to manipulate an outboard joystick or mouse.

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LETTERS

TO THE EDITOR

1525 Emulation Mode on TurboPrint/GT

Two or three years ago I purchased a TurboPrint/GT printer Interface which was upgraded with the 1.1 ROM and, according to the manual, will go into 1525 emulation mode.

After much reading of the manual and adjustment of the DIP switches I can't get the interface to emulate a 1525 printer.

Is there anyone out there who has one of these units and could advise how to achieve 1525 emulation?

Peter Bungay
Wagga Wagga, NSW

CAD program

Firstly, may I compliment you on an informative and well presented publication, and congratulate you for being one of the few around which presents occasional hardware construction projects! I am an electronics technician and feel that with only a basic knowledge of electronics a hobbyist would have no real problems in construction of these projects.

Because of the nature of my work, I have been looking for a CAD program which would allow me to draw and change both printed circuit layouts and schematic diagrams. The only packages available so far have been for the IBM machines and clones and about the best I could do in terms of Commodore programs was to use GEOS and the pictures and text from GeoPaint and GeoWrite together.

It came as a pleasant surprise,

therefore, when I was recently given a pile of magazines (ACR included) and found a "dot matrix circuit diagram" in your magazine. I believe the publication was dated August 1987 and the article was "Fast Change Button".

I would be very grateful if you could tell me which package produced this diagram and if it is available in Australia for the 128.

Dale G. Cuffe
Para Hills, 5096

Ed: There are two possibilities:

1. CAD 64 and CAD 128 which I have not seen. However they are the only CAD programs for these two computers that I know of. (CAD 64 RRP \$89 128 \$120)

2. Flexidraw. This is primarily a drawing package but it has circuit components as a clip-art. (RRP \$69)

Both have pros and cons, of course, but are the best recommendations we can make.

All these programs are distributed by Computermate (02) 457 8118. If you have difficulty getting them from your dealer contact our editorial office on (02) 817 0011.

Geos - more speed

I have had my Commodore 64 for about four years now and have ended up going the path of Geos rather than upgrading to an Amiga. In converting to Geos, I have acquired a second 1541, a monitor and a 1351 proportional mouse. I intend to use the C64 and Geos for the remaining useful life of the system and so am trying to find ways

around some of the current shortcomings.

Firstly, I am looking for more DISK SPEED! I quite like Geos and recognise that an 8 bit processor has its computational limits, but the most irksome thing is the time that every disk access soaks up, especially page changes in Writer's Workshop and swapping prior to the appearance of desk accessories. So far I have read of two possibilities - a 1764 RAM expansion cartridge and the Dolphin Dos parallel drive system. Are you planning reviews of these? I have seen general reviews of the two systems elsewhere, but nothing specific about benefits to or compatibility with Geos.

I queried Commodore product support about the RAM cartridge but was informed that, because of the cost of producing an uprated Australia-only power supply, the RAM expansion would not be marketed by Commodore Australia. Do you know of anyone producing mods for the existing power supply, or in a position to make some up? I may be blinded by enthusiasm for my faithful machine, but I feel that there will be an expanding market of serious users looking to buy such performance upgrades. By way of a trend indicator, here in Perth last Christmas, the number of available 1541 or compatible drives could be counted on one hand. Apparently, most of the buyers were upgrading their cassette-based Family Packs.

Any advice you could offer about speeding up my GEOS sys-

tem would be much appreciated.

Matthew Townsend
Kingsley, WA

Ed: Firstly the 1764 RAM card is not available in Australia and as far as we can tell neither Commodore nor anyone is else is planning to change this situation, which is why we are not planning to review it. There is a review of Dolphin Dos in the Commodore Annual 1988, (available from your newsagent or this office). We have a Geos columnist now, see our April and future issues.

Amiga programming

Your ACAR is the best Commodore magazine in Australia, and in the present climate one that all Australian Commodore users should be buying. It has all that the overseas mags have, also the other Aussies such as APC and Your Computer. I have discontinued APC, as it does not offer much of use for Commodore machines. Your Computer has a small set up offering a small amount of Amiga and C64 information.

In reply to your Ed: re letter from Dave Evans (a good Welshman there) of Ballarat. I do not consider myself old at 62, I will be not old until somewhere around the 1000 mark. What do I use my machine for? First, I use it to keep my home accounts in some order, especially to ensure I do not over spend my Viatel account. Secondly, my grandchildren play on the C64 when they call in to see us. I also play a game of chess and Endless on it now and then.

How am I going to learn to program, you ask. With difficulty I reply. Still I have a go at it every so often. Like Dave Evans, I do not understand much in computer talk, and now that I have an Amiga, I

find the inner sanctum even harder.

Therefore if I have one request it is that ACAR begin a series of lessons simplifying the mysteries of the Amiga. By the by, in "Basic is Easy Part 1", if the syntax of colons, semi-colons are left out all that will come up on the screen will be Syntax errors.

I would like to endorse another oldie (at 38)??? i.e. John Casey of Torquay, Qld, in the February issue. That you would offer hard covers for both C64/128 and Amiga.

An excellent magazine. Look forward to the larger editions coming.

R.L. Austin
Ermington, NSW

Ed: We couldn't have written a better appraisal ourselves. To your request of an Amiga section on programming, we are in the throes of organizing one such column now and hope to have it in the June or July issue, so watch out. It goes to show, you are only as old as you want to be.

Datasette to disk

I have a Commodore 64 computer with a 1541 disk drive and a 1530 datasette. Unfortunately, most of my best games are on tape and occasionally they do not load properly because the datasette is always going out of alignment. I would like to be able to transfer them to disk so that loading would be easier and a lot quicker, however they are not written in Basic and I do not have any software that allows me to do this, and so I have to put up with the possibility of games occasionally not loading.

Could you please tell me if there is any software that would allow me to perform such a task, and if so, where can it be purchased in the Sydney region.

Mark January
Lindfield, NSW

Ed: In the 1987 Christmas issue we reviewed a cartridge called Action Replay MkIII. This converts what is in memory to a compacted disk file. The way it works is by taking a 'snapshot' of the computer's memory and saving the disk. This does, however, present some problems with games that load in sections from tapes such as Skyfox. Available from Westend Computers (03) 350 5144.

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The two power programs \$59

Our book **Treasure Chest** for C64/128 is still available. It is a compact and handy guide full of unusual programs, sub routines and programming hints. Learn to use POKE PEEKS USR SYS and other tricks buy the book and get free Lotto Analyser, Typing Tutor or Maths Tutor on disk or tape.

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Impossible Mission 2

by Andrew Farrell

In 1986, Impossible Mission won the then yet to be coveted PC Games magazine game of the year award. It was no coincidence that at that time Andrew Farrell was contributing great wads of editorial to the magazine. In fact, rumour has it that he alone chose the winning game.

WITH SUCH A brilliant career behind it, could *Impossible Mission 2* ever hope to live up to its past reputation? For such a success story to continue, the game designers would need to maintain the best features of the old and incorporate new ideas and challenges for part 2.

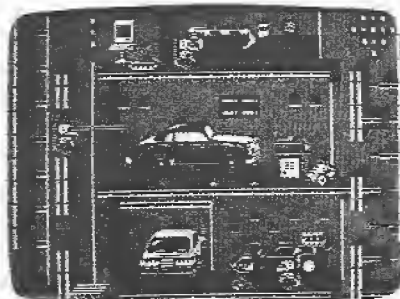
And Epyx has done just so. The second instalment opens with those famous words, "Another visitor . . . Stay a while . . . Stay forever!".

Elvin is back, alive and well at the top of a massive complex of towers and security doors, depicted in the opening scene.

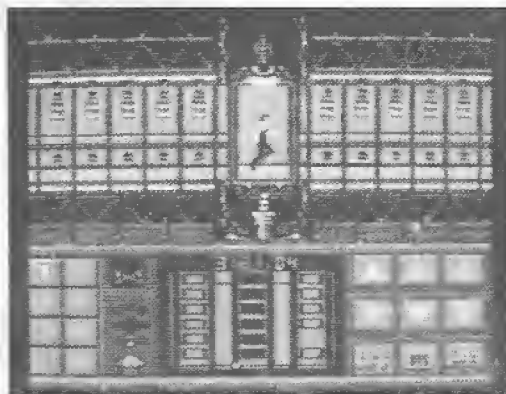
Plot

Your objective is to save the world from being destroyed by the psychotic machinations of the genius himself, Elvin. The steps involved correlate roughly to the main features of the first mission.

First you must assemble a three digit security combination for each of the eight towers, whilst avoiding the robots - of which there are a few new breeds.



Gone are the awkward puzzle pieces to be flipped and twisted into matching pieces. A new wrist computer, with new functions, enables the codes to be assem-



Manoeuvre through murky passageways . . .

bled.

Next you must locate and open Elvin's safes, and recover the musical sequences locked inside. There are six unique pieces of music and two duplicates. As if that wasn't enough, you must then tie together these musical sequences into a full melody that will open the express elevator doors to Elvin's central control tower room. Your wrist computer features an in-built cassette player, with editing functions to enable the melody to be constructed.

Finally you face three computer terminals in Elvin's control room. Two are spiked with several thousand volts, whilst one will disarm the missile launch codes - remember, the ones that were going to destroy the world? . . . To

make it extra hard, there's no way of telling the three terminals apart. Fortunately there is a save game feature, which will allow you to restore previous situations.

Game-play

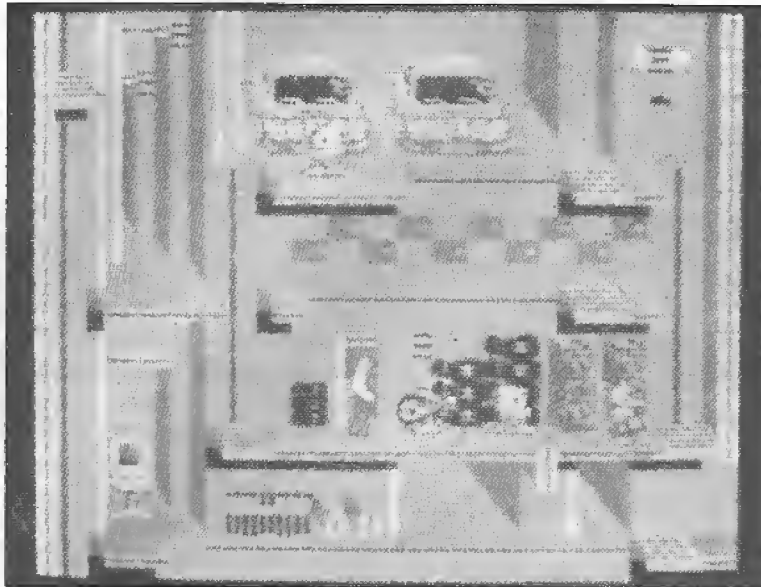
Impossible Mission became famous partly because of the incredible animation of your man somersaulting through the air, and partly because of the adventure-like scenario. Part 2 enjoys the same animated sequences, however the scenery has been greatly enhanced, as has the plot. Your man is also now capable of the squat position, primarily for travel on sliding platforms.

The game proceeds in much the same fashion, with play commencing in one of the many elevator shafts. The elevator can be moved up or down to a room. At the very top and bottom of each shaft is a passageway leading to the next tower. This is where the security code is required in order to pass. So now each level or tower must be completed before the next can be attempted, providing a definite feeling of progress.

In itself, the elevator is smarter looking than in *Mission One*. It now comes complete with a spinning operating gear, and stops far more easily at the desired level.

In the corridors, as you run the floor lights up. A nice touch. The walls and roof are more complex, perhaps a little overdone, giving a more hi-tech atmosphere.

Once you enter a room, the differences become apparent. A more three-dimensional looking design appears. You can still only move in two dimensions, but the feel is there. In addition to lifting platforms there are now also sliding plat-



... dodge human-seeking
suicide-bots ...

forms. These can be controlled in some instances by standing on the platform, and pulling down on the joystick, then moving it either left or right. Others can only be manipulated from a terminal in the room.

Four additional functions are now available, including switching lights on, time bombs and mines. These last two are an amazing feat in themselves. Once you blow up a portion of any platform, that's the way it remains for the rest of the game. Great for getting rid of annoying robots, or reaching those hard to get at places. But care is needed, or you could well become the victim.

Mines must be bumped into, whilst a time bomb will detonate after a few seconds - primarily for gaining entry to safes.

Robots

More intelligent, but apparently low-voltage. Gone are the twisting electrical bursts of energy. Instead we have one

feeble bolt that doesn't look anywhere near as dramatic. However, it disables your man just the same.

There are six models in all. The basic version, the sentrybot, is armed and dan-

gerous. You've met him before. Mine-bots run around laying mines, which you can see, and have no effect on the level if detonated. They're just a pain.

Pestbots are harmless, however they ride the lift platforms continually messing up the arrangement you've organised. Sometimes they work for you, and sometimes they really foul things up.

Squatbots are great. They look like spring loaded seats. Stand on one, and it will propel you up in the air, helping you to leap to the a nearby platform. Be careful though as they can also squash you against the roof.

The bashbot is a real hassle. Once he grabs you, you're a goner. He'll push you right off the edge! His relative the

suicidebot will do much the same, but as you probably guessed, he jumps with you just for the ride ... Ahh Ahhhhhh Ahhh!

Graphics

The game has a totally different look from the original, however the overall feel and game play is very similar. Sometimes the rooms and hallways look a bit overdone, but on the whole, *Impossible Mission 2* is a big improvement in the graphics department. Animation wise, the robots are more interesting, your man is exactly the same, but the bolts of energy the robots release are pathetic - what happened?

Music and effects

A new opening music piece sets the scene. Apart from that the sound effects are much the same. Which is good, because they are very much what *Impossible Mission* is all about.

Conclusions

If you enjoyed the first mission, this one will get you right in. It's easier to make progress, since you don't have to mess around with pretty shapes, but overall, your objective is much tougher. Each room has far more challenges, with far more ways of getting prematurely terminated.

Fortunately there's often more than one way to get to every object. This is a big help in sticky situations. Don't be alarmed if you begin the way I did, getting zapped once every ten seconds. It does take some getting used to these new second generation robots.

I think *Impossible Mission II* could well be in the running for another award. We might have to start handing one out here at *Australian Commodore Review* just for this game.

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desperately search for clues to
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Bit mapped graphics on the 128's 80 column screen

Many people know it is possible to bit map graphics on C128 in 80 column mode, however not many people understand how to go about it. Frank Peterson explains the mystery behind this very useful facet of the C128. The added speed of the C128 and availability of higher resolution will make graphically orientated programs such as GEOS come to maturity.

THE OTHER DAY I was browsing through a magazine and saw an article on controlling the 8563 Video Display Chip, or the VDC as it is more conveniently known. This chip is responsible for the 80 column screen on the C-128 in 128 mode, and in the article there was some considerable discussion on how you could change the screen height and width with various pokes, etc.

It was quite interesting, but these facilities are readily available to the 128 user via the WINDOW command in BASIC 7.

What really piqued my interest was a comment to the effect that you could bit-map the 80 column screen via the 8563 chip. That's right - high resolution graphics on the 80 column text screen! What I thought might have real potential was the resolution ... if the 40 column screen available from the VIC chip could give a resolution of 320x200, could the 80 column screen do better? A little logic and some investigation to confirm it revealed that indeed it could.

The characters on both the 40 and 80 column screens are made up of an 8x8 matrix of dots, or pixels as they are called. This matrix includes the inter-character and inter-line spaces of one pixel each, so that actual letters are seven pixels wide by seven high. Add the horizontal and vertical spaces of one pixel each, and you have a matrix of 8x8 pixels. Each of these 8x8 character units ad-

join, both vertically and horizontally.

If you have a screen capable of displaying 40 characters across and 25 down, then it can display 40x8 or 320 pixels across, and 25x8 or 200 down. Since a pixel is the smallest visual element a computer can display, we say that the resolution on this screen is 320 by 200.

Similarly, if the screen can display 80 characters across and 25 down, and the same 8x8 matrix is used, then the resolution will be 80x8 (640) across by 25x8 (200). The higher resolution is achieved by using smaller pixels. The higher the vertical or horizontal resolution, or both if the hardware designer can swing it, the higher the picture quality. Curves will appear smoother, diagonal lines will appear straighter, screen characters may be smaller and still be legible and in colour applications, colours will blend more smoothly.

The 8563 Video Display Chip supports monochrome bit mapping of the 80 column screen, and yes, the resolution is 640 by 200. Curves and shapes drawn on this screen are markedly smoother than those on the VIC screen. Problem is, "How do we do it?"

How do we do it?

Well first, we have to know a little about the 8563 chip and its registers. There are 37 registers used to control the chip. With careful and selective use of

these, you can alter the number of columns and lines displayed, the left, right, upper and lower margins, whereabouts character memory is, etc.

These registers are used by the 128 Operating System to properly dimension screen windows in response to the WINDOW command from BASIC. There are other things as well, like cursor type, cursor and character flash etc, which are available via Escape and Control codes from the keyboard - all controlled by the Operating System through the 37 control registers on the VDC chip.

Registers are like bytes of memory - they have eight bits (numbered 0 to 7) and each bit may be set on or off. Each bit, or a combination of bits, may be used to control a particular function of the chip. We are interested in register 25 of the VDC because bit 7 controls the switching between hi-res and text mode. Also bit 6 controls whether or not attribute RAM is selected. Bits 5 and 4 control functions related to text mode and don't interest us right now. Bits 0 to 3 are used in controlling horizontal scrolling, and while not of interest now, may later provide us with the ability to scroll the bit-mapped screen. More investigation needed, but it sounds promising.

A couple more things before we get started drawing pictures:-

First, we have to draw our picture somewhere in RAM so that the VDC has somewhere to fetch the data from. The VDC has its own 16k of RAM, made up of character and attribute RAM. In hi-res mode, we don't need any of the data normally stored there, and since a 640x200 hi-res screen needs 16k of RAM to store it, what better place to use than the now redundant character/attribute RAM which the chip is already set up to use? The character RAM is already available - all we have to do is clear the

character data out of it when we go to hi-res mode. To disable attribute RAM and make it available for us to use, we have to clear bit 6 of register 25, and we can do that at the same time as we set bit 7 to enable hi-res graphics mode. We perform both functions by loading register 25 with 128.

(For any beginners out there - if you want to set a bit in a location, you POKE the location with 2 raised to the power of the bit number. For example, to set bit 7 of location 8000 (decimal), you would POKE 8000 with 2^7 . ie POKE 8000,128. To set bit 5 of the same location, POKE 8000 with 2^5 or POKE 8000,32. If you want to set both bits 7 and 5, then add the two numbers and poke the total to the location. In this example, POKE 8000,160 would set bits 7 and 5 in location 8000. If you

need to know which bits are set and which aren't, you can make things clearer for yourself by writing your pokes in longhand, like this ... POKE 8000, $2^7 + 2^5$. This is fine for experimenting, but at run time, slows things down dramatically because BASIC has to calculate all the pokes before actually doing them. Also, if you want to set and clear some bits in a location without affecting others, things get a bit more complex, and an explanation is beyond the scope of what we're dealing with here.)

Another thing to remember is that having cleared character RAM and disabled attribute RAM to draw our screen, when it comes time to return to text mode, we have to replace the characters in character RAM and re-enable attribute RAM in order to return the computer to normal. Unlike the 64, the 128 doesn't

get its character information directly from ROM. On power-up or reset it copies character data from ROM down to the VDC's character RAM and then gets its character info from there. When we've finished using character RAM for our own purposes in hi-res mode, we must ensure that character data is copied down from ROM either by software (more convenient) or by a reset less convenient).

The last point is that there are three versions of the 8563 chip, 7A, 8 and 9, and to return the chip to normal text mode from some other mode, register 25 must be loaded with the correct value for the version. The correct value for version 7A is 64 decimal or 40 hex, while that for both versions 8 and 9 is 71 decimal or 47 hex. I think the majority of Australian 128 owners will have version

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8 or 9 installed. To find out which version you have, reset the computer, PEEK location 54784 (PRINT PEEK(54784) <RETURN>) and convert the number to binary. An easy way to do this last step is to enter the Monitor with F8 and type + followed by the number your PEEK returned. Bits 0 and 1, the rightmost bits, will contain the code for your version of the chip. 00 indicates version 7A, 01 indicates version 8 and 11 indicates version 9.

You can also do it less precisely, but adequately with the following line:-

```
POKE 54784,25: PRINT PEEK(54785)
```

A result of 64 indicates version 7A, while 71 indicates either version 8 or version 9.

Problems . . .

Well, now we're all set to go, I have to confess there is a problem. Folks, you can't really do hi-res graphics on the 8563 in BASIC. The graphics commands in BASIC 7 are not supported by the 8563 chip because they were designed for the 40 column VIC chip.

Lacking special commands, the only other way to do it is by PEEKing and POKEing, as on the 64. The only way to instruct the 8563 chip to do anything (or to tell you anything) is indirectly via two locations, which will slow it down even more. You have to POKE the first location (\$D600, 54784) with the number of the register which you want to write to or read from and then POKE the second location (\$D601, 54785) with the actual data you want to write, or PEEK it to read the data you want to get. This is fine when you're just experimenting with the chip; but once you know what you're doing and want to read and write bulk information, it's plainly impractical.

To demonstrate how slow BASIC is, try the following one-liner which simulates clearing the bit-mapped screen:-

```
TIS="000000": FOR I = 1 to 16000:  
POKE 8000,0: NEXT: PRINT TIS
```

As you can see, it takes around two minutes. This is about the time it would take to do the simplest of tasks, to clear all points on the screen. How long would it take to calculate whether each of 16,000 points should be on or off according to an algorithm and then set or clear them? Well, I've seen a 64 run a 3D shape generator written in BASIC. It took 45 minutes to draw a hi-res donut shape generated by using mathematical formulae, and we have twice the number of points to plot! Nuff sed. Machine code to the rescue!

Program 1

Program 1 is an Assembly language program that will speedily perform the five basic functions needed to implement hi-res graphics on the 8563 chip. Enter it using the Monitor. The code resides at \$0C00 in the 128's RS-232 buffer, so unless you are into communications and simultaneous hi-res graphics development, it shouldn't conflict with anything.

The functions and their SYS calls are:-

```
Enable hi-res graphics and clear the screen  
SYS DEC("0C00") Clear the graphics  
SYS DEC("0C03") Disable hi-res - Enable text  
SYS DEC("0C06") Set a pixel  
SYS DEC("0C09") Clear a pixel  
SYS DEC("0C0C")
```

The program allows you to pass the coordinates of the pixel you want to set or clear with the SYS call. Because the X coordinate can exceed 255 (it can go as high as 640), it must be passed as two bytes, in 6502 standard low-byte/high-byte format. To get the low byte, perform a logical AND with 255; to get the high byte, simply divide the coordinate by 256. The standard form of a call to set or clear a pixel is:-

```
SYS <address>, X LOW, X HI, Y
```

Example: To set a pixel at coordinates 320,100 (the centre of the screen), the SYS call would be

```
SYS DEC("0C09"),320 AND 255, 320/  
256, 100.
```

If your version of the 8563 chip is revision 7A, change byte number 0CD6 to 40 hex, so that the listing will appear as

```
00CD5 A9 40 LDA #40.
```

If you don't do it, on return to text mode you will lose most of the last character on each line of the screen, though in all other respects, the computer will operate normally. Similarly, if you have a revision 8 or 9 chip and byte 0CD6 contains 40 hex instead of the correct value of 47 hex, most of the leftmost character on each line will be lost. The quirk occurs because horizontal smooth scrolling has been modified in the various revisions, and that in turn is affected by the contents of bits 0 to 3 of register 25 of the VDC. The difference of 7 in the values loaded into register 25 for the different versions alters the contents of bits 0 to 3, and this in turn affects the horizontal display of the 80 column screen. It's nice to get it right!

After typing in Program 1, save it from within the monitor with:-

```
S "filename" 08 0C00 0CEA
```

I suggest you program one of the function keys to re-enable text mode, as follows:- (I used the F5 key)

```
KEY5,"SYS DEC("+CHR  
(34)+"0C06"+CHR$(34)+")"+CHR$(  
13)
```

This will be invaluable in regaining a lost screen should it wander away - believe me, it will!

Program 2

Program 2 is a basic program which will utilise the routines in Program 1 to

plot curves and shapes on the 80 column screen.

Type it in as shown and SAVE it before you do anything with it. (Don't you always!) Run it only AFTER you have entered Program 1. If both programs have been correctly entered, you should see the text screen disappear, some graphics garbage and then the screen will clear to black. Horizontal and vertical axes will be drawn and after a short pause, a gradually diminishing sine wave should be plotted point-by-point.

The two programs go together and have been thoroughly played with and work as presented here, printer's Grem-lins notwithstanding. (Sorry, Ed.) If you have problems, you can exit with STOP/RESTORE. If you don't get a screen back, and you've programmed a Function key as suggested, hit that key. If your typing on Program 1 was accurate, you should get your screen back as the 8563 returns to text mode. You can then set about de-bugging either your m/l program or the BASIC program, or both!

If the STOP/RESTORE and function key combination doesn't return your screen, reset the computer and check the m/l code you typed with the monitor because at least some of the fault will most certainly be there. (Even after a reset, m/l code remains in memory, so unless you

turn your computer off, you won't have to re-load Program 1.) Save any altered versions before running them. Once you're sure that you have the m/l absolutely correct, re-load the BASIC program (you DID save it, didn't you?) and check it against the listing. Again, save any amendments!

Program 2 is sufficiently commented to be self explanatory. Integer variables (identified by % signs) have been used where possible to increase speed. The line which generates the shapes is line 30. You can mess around with this to your heart's content, but you may have to use a bit of mathematical skill in scaling the results so that they reach the screen. The Origin (ie 0,0) of the Screen is the top left corner. X is plus to the right, maximum 640; Y is plus going down, maximum 200. You cannot plot a point whose coordinates are negative, nor can you plot positive coordinates with X greater than 640 or Y greater than 200. You may also have to alter the value of C in line 150, depending on what you do in line 30.

Here are some functions I tried in line 30. Any changes to C in line 150 apply only to the example they appear alongside:-

DEFFNR (X) = 40*SQR(1-(COS

(X)^2))+100.

DEFFNR (X) = -40*SQR(1-(COS (X)^2))+EXP(0.1*X)+200

DEFFNR (X) = 4*SIN(X)+100

DEFFNR (X) = 10*(SIN(X)^2+TAN (X))+100

DEFFNR (X) = .3*(3*X^3-3*X^2-20*X-12)+100. C=-10

DEFFNR (X) = 40*TAN(X)*EXP(-0.1*X)+100 C=-20

DEFFNR (X) = (SIN(X)*EXP(2*COS (X)))*EXP(0.1*X)+100 C=-20

Experiment and see what you come up with. I tried to draw a circle, which should not be a difficult task, but gave up only because the midnight oil was pretty low and the brain got slow. Maybe you can do it. Try algebraic expressions, as in the third last example.

You can see that there's a lot of potential here. An advanced programmer could write a database/spreadsheet/graphics package utilising just the 80 column screen to produce a polished, professional product.

Without too much trouble, an average BASIC programmer could probably write something to help the kids understand math functions and the effects of changing powers and coefficients, etc.

I won't try to explain Program 1 in detail, for if I did, I would have to go

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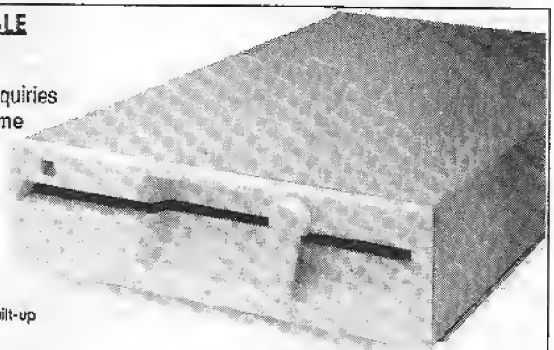
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way beyond the scope of this article and probably get bogged down in an area which I'm really only learning about myself. Instead, I will point out the parts of the program which carry out functions significant to our discussion and hopefully encourage some of you to work on the program and maybe develop and improve it. I would be interested to hear about it if you do.

Locations 0C00 to 0C0E set up a jump table to the five functions of the program.

Locations 0C0F to 0C1A contain the code to write data to an 8563 register. Before jumping to this sub-routine, the number of the 8563 register to be written to must have been stored in the CPU's X register, and the actual data to be written must have been placed in the Accumulator.

Locations 0C1B to 0C26 con-

tain code to read data from an 8563 register. Before jumping to this sub-routine, the number of the register to be read from must have been placed in the CPU's X register. The data will be returned in the Accumulator.

Locations 0C27 to 0C2D set up register 25 to enable bit-mapped graphics.

Locations 0C2E to 0C45 and **0CD0 to 0CD9** contain code to turn off hi-res graphics and reset register 25 to its default contents for text mode.

0CDA is a jump to the routine to copy character ROM to 8563 RAM upon return to text mode.

The pixel-set and pixel-clear routines share some common code. Pixel clear starts at **0CDD**, jumps to **0CE1** where the X and Y coordinates are stored in page 1 user locations, and then at **0CE7** jumps to the main set/clear routine at

0C46.

Pixel-set starts at **0CE0** then follows the same route as pixel-clear, the difference being that the Carry bit in the CPU Status register is set for pixel-set and clear for pixel-clear.

Well, that's about it. I think we've opened up an area full of possibilities for useful applications. For people who are feeling their way around machine code and the abilities of the computer, there is great potential for interesting experimentation with a satisfying visual result, and I encourage you to do that.

For more information, refer to the *C-128 Programmers Reference Guide* from Bantam Books and *The Anatomy Of The Commodore 128* from First Publishing.

Author correspondence to Frank Paterson, 137 Wyangala Cres., Leumeah, NSW 2560. ■

Program 1

```
00C00 4C CD 0C JMP $0CCD
00C03 4C D0 0C JMP $0CD0
00C06 4C D3 0C JMP $0CD3
00C09 4C E0 0C JMP $0CE0
00C0C 4C DD 0C JMP $0CDD
00C0F 8E 00 D6 STX $D600
00C12 2C 00 D6 BIT $D600
00C15 10 FB BPL $0C12
00C17 8D 01 D6 STA $D601
00C1A 60 RTS
00C1B 8E 00 D6 STX $D600
00C1E 2C 00 D6 BIT $D600
00C21 10 FB BPL $0C1E
00C23 AD 01 D6 LDA $D601
00C26 60 RTS
00C27 A2 19 LDX #$19
00C29 A9 80 LDA #$80
00C2B 20 0F 0C JSR $0C0F
00C2E A0 40 LDY #$40
00C30 A2 12 LDX #$12
00C32 98 TYA
00C33 20 0F 0C JSR $0C0F
00C36 A2 1F LDX #$1F
00C38 A9 00 LDA #$00
00C3A 20 0F 0C JSR $0C0F
00C3D A2 1E LDX #$1E
00C3F 20 0F 0C JSR $0C0F
00C42 88 DEY
00C43 10 EB BPL $0C30
00C45 60 RTS
00C46 08 PHP
00C47 A5 FA LDA $FA
00C49 85 FE STA $FE
00C4B 46 FB LSR $FB
00C4D 66 FA ROR $FA
```

```
00C4F 46 FB LSR $FB
00C51 66 FA ROR $FA
00C53 46 FB LSR $FB
00C55 66 FA ROR $FA
00C57 A9 00 LDA #$00
00C59 85 FD STA $FD
00C5B A5 FC LDA $FC
00C5D 06 FC ASL $FC
00C5F 26 FD ROL $FD
00C61 06 FC ASL $FC
00C63 26 FD ROL $FD
00C65 65 FC ADC $FC
00C67 85 FC STA $FC
00C69 90 02 BCC $0C6D
00C6B E6 FD INC $FD
00C6D A2 04 LDX #$04
00C6F 06 FC ASL $FC
00C71 26 FD ROL $FD
00C73 CA DEX
00C74 D0 F9 BNE $0C6F
00C76 A5 FA LDA $FA
00C78 65 FC ADC $FC
00C7A 85 FC STA $FC
00C7C 90 02 BCC $0C80
00C7E E6 FD INC $FD
00C80 A2 12 LDX #$12
00C82 A5 FD LDA $FD
00C84 20 0F 0C JSR $0C0F
00C87 E8 INX
00C88 A5 FC LDA $FC
00C8A 20 0F 0C JSR $0C0F
00C8D A2 1F LDX #$1F
00C8F 20 1B 0C JSR $0C1B
00C92 48 PHA
00C93 A5 FE LDA $FE
```

```
00C95 29 07 AND #$07
00C97 AA TAX
00C98 68 PLA
00C99 28 PLP
00C9A B0 05 BCS $0CA1
00C9C 3D C5 0C AND $0CC5,X
00C9F 90 03 BCC $0CA4
00CA1 1D BD 0C ORA $0CBD,X
00CA4 48 PHA
00CA5 A2 12 LDX #$12
00CA7 A5 FD LDA $FD
00CA9 20 0F 0C JSR $0C0F
00CAC E8 INX
00CAD A5 FC LDA $FC
00CAF 20 0F 0C JSR $0C0F
00CB2 A2 1F LDX #$1F
00CB4 68 PLA
00CB5 20 0F 0C JSR $0C0F
00CB6 A2 12 LDX #$12
00CBA 4C 1B 0C JMP $0C1B
00CBD 80 40 20 10 08 04 02 01
00CC5 7F BF DF EF F7 FB FD FE
00CCD 20 27 0C JSR $0C27
00CD0 4C 2E 0C JMP $0C2E
00CD3 A2 19 LDX #$19
00CD5 A9 47 LDA #$47
00CD7 20 0F 0C JSR $0C0F
00CDA 4C 0C CE JMP $CE0C
00CDD 18 CLC
00CDE 90 01 BCC $0CE1
00CE0 38 SEC
00CE1 85 FA STA $FA
00CE3 86 FB STX $FB
00CE5 84 FC STY $FC
00CE7 4C 46 0C JMP $0C46
```

Program 2

```

10 REM ** EXAMPLE PROGRAM FOR 8563 HI RES
GRAPHICS **
20 :
30 DEF FNR(X)=40*SIN(X)*EXP(-.1*X)+100
40 FAST-TRAP 1000: REM IN CASE OF ERROR IN FNR(X)
50 F%=256: FF%=255: SE=DEC("C09"): RE=DEC("C0C")
60 SYS DEC("C00"): REM GRAPHICS ON
70 Y%=100: REM DRAW X COORDINATE
80 FOR X = 0 TO 639 STEP 3: REM DOTTED LINE
90 : SYS SE, X AND FF%, X/F%, Y%
100 NEXT
110 X%=320: REM DRAW Y COORDINATE
120 FOR Y=0 TO 199 STEP 2: REM DOTTED LINE
130 : SYS SE, X% AND FF%, X%/F%, Y
140 NEXT
150 C=-32
160 FOR X=0 TO 639 : REM PLOT FUNCTION DEFINED IN
LINE 30
170 :FU%=FNR(C): IF FU%<0 OR FU%>199 THEN 190
180 :SYS SE, X AND FF%, X/F%, FU%
190 C=C+0.1
200 NEXT
210 GETKEY A$: REM *** DONE. WAIT FOR KEY. BACK TO
TEXT ***
220 SYS DEC("C06"): PRINT CHR$(147): SLOW
1000 PRINT ERR$ (ER);EL

```

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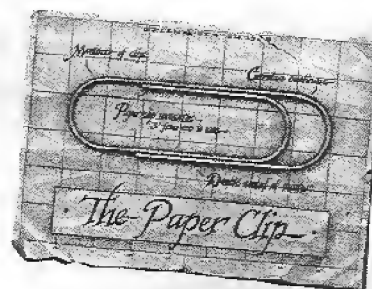
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PaperClip

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by Adam Rigby

PRODUCING A magazine requires, as you can appreciate, a substantial amount of word processing and a word processor that is quick and easy to use as well as being very powerful. Such word processors to date have only really been available on the larger PC's such as the IBM compatibles and 68000 computers. Could *PaperClip III* make such power and ease of use available on the C64 and C128? ... Let's have a look.

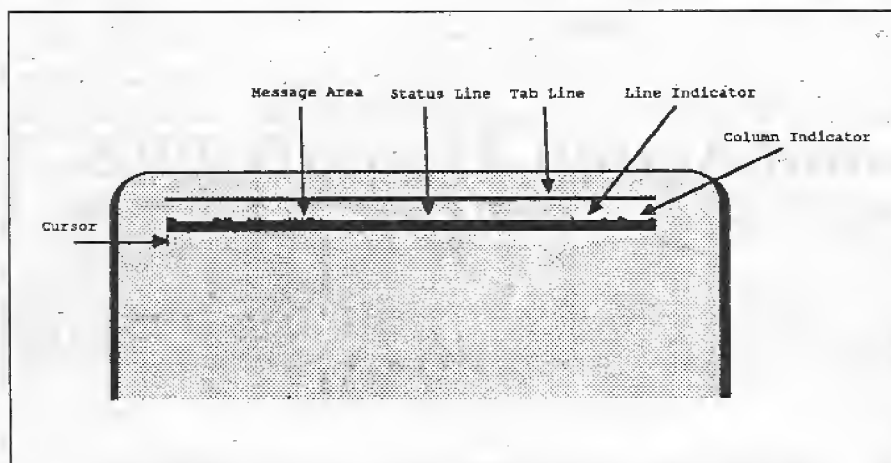
To my surprise there were two separate versions of *PaperClip III* in the package, one for the C64 and a separate ver-

1750 RAM card, is an interactive spelling checker. This allows the user to set up a continual spelling checker in RAM that checks for spelling errors as you type, an annoying but useful utility. It is probably similar to when your wife comes in the room as you are composing some of your best computer jargon, and says;

"You spelt 'computer' with two 'r's on the end, dear."

It totally kills your concentration. Even when you explain to her that you will check all the spelling after you have

Communications Options	
Baud Rate (BPS)	300
Parity	NONE
Word Length in Bits	8
Duplexing	FULL
Text Buffer	Capture
XON/WOFF Handshaking	Enabled
Link Handshaking Protocol	Pin 1 CA
Modem Type	Modem 300/1650
RS-232 Control Signals	Normal
Communication Type	ASCII
Auto-Line Feed	Off
Line Feed Generation	On
Backspace Code	8
Form Feed Response	Line Feed
Bell Response	Beep
Reverse-Field Printing	Disabled
Control Characters	Visible
Clock Display	Clock #1
Set Clock	



sion for the C128. There is quite a difference between the two versions. The C128 version supports various novelties such as 80 column screen handling and an impressive interlace mode whereby you can see 50 lines of text - this feature is only available to video preview, not editing.

Another useful feature that is available to C128 owners with access to a

completed the critical creative side, she still keeps on.

"There is no 'k' in the word 'literal'."

Still, considering that I did not have access to a 1750 RAM card, I am speaking from intuition rather than experience.

What C128 program would be complete without the use of the 1571 Burst

mode for super fast data transfer. This makes the Spelling checker quite a bit faster, of course.

Opening up the manual, I was rather impressed with the extensive Contents page covering every topic that you could possibly want to know about as well as, shock, amazement, a reasonable index - things not usually found in a computer software manual.

The manual itself is in three parts. Part one is the introduction which covers LOADING, COPYING and various details indigenous to the C64 and C128. Part two covers a very basic introduction to word processors which would prove extremely helpful to people not accustomed to such things. It goes as far as to say things such as "Don't be afraid of moving the cursor over text you've typed - moving the cursor doesn't affect text." Part three contains reference information ordered in sympathy with the user's requirements - put simply, the manual is

written in a natural progression of learning blocks.

Using PaperClip III

The interface for selecting various functions could not be better. When you press a function key a window pops up with a menu in which its components are selectable by an inverse bar. Selection is very simple just move the bar with the cursor keys until it highlights the desired selection and then hit return, what could be simpler and quicker?

By pressing 'F7' you bring up the main menu where you can select the main control functions such as:

- New Document.
- Load document.
- Save Document.
- Disk directory.
- Search text.
- Search and replace text.
- Print document.
- Video Preview.
- Check spelling.
- Telecommunications.

As you can see this whole procedure is very simple and doesn't require the user to remember any complicated keypress combinations, and I am definitely all for that.

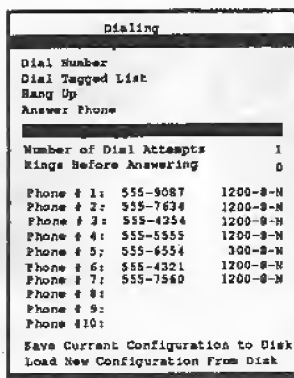
Running over the specifications, we can indeed see that this package has powerful features, they are as follows.

Editing

- Full screen editing - insert/delete, move, copy, global search and replace.
- Instant phrases - use 52 user-defined phrases, each accessed by a single keystroke.
- Edit text blocks by character, word, sentence, or line with wildcard searches, start or end of word matches.
- Move, delete, sort and add columns.
- Preview documents before printing in 40, 80 or 160 column, with four-way scrolling.

Printing

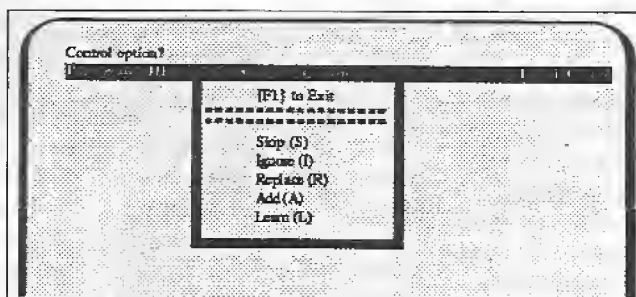
- Proportional spacing.
- Supports letter quality printing.



- 8 different printer pitches available.
- Supports double-height printing.
- Pause during printing and restart at previous page.

Formatting

- Underline, boldface, italics, superscript and subscript.
- Automatic table of contents.
- Built in outliner.
- Automatic paging, page numbers.



- page headers and footers.
- Arabic or Roman numeral page numbering.
- Regular and numeric tabs.
- Double and triple spacing.
- Centre, justify, left or right text align.

Compatibility

- Reads most popular word processing files, including all previous versions of *Paperclip*, *Wordwriter 3*, and *Bank Street Writer*.
- Compatibility with virtually every popular printer - dozens of built-in printer files, or create your own.

Spelling checker

- Built-in 40,000 word spelling checking.
- Customizing of the dictionary at the user's discretion.

Built-in telecommunications

- Complete, easy transmissions or reception of text by modem with you're running *Paperclip*.
- Automatic dialing and redial.
- Supports most popular modems and Baud rates.
- Upload and download text to disk or memory.
- One-key switching to word processing and back again.

Overall

Paperclip III is a vast improvement over other word processors for the C64 and is probably the best that I know of

to date for the C64 and the C128, however, I have one big problem with the program. The movement around your document is not as extensive as you would expect. You cannot move the cursor one word at a

time and you cannot delete one word at a time.

This may not sound like a big problem to most people, but some who uses a word processor for their business would find the lack of these features an annoyance in every day use. This is a shame because the package is so effective in all other aspects except the most simple ones.

Distributed by ECP (075) 963 488
RRP \$89.95. ■

Packet Radio

Computers on air

by Tony Smith

RECENTLY I WAS invited by a couple of VK's (HAM radio operators) to attend an Amateur Radio Field Day at Gosford. As a former CB user, I went to see what developments were happening in the radio world. My pals mentioned to me that there would be quite a bit of computer stuff there, and what an understatement that turned out to be.

Having recently developed an interest in telecommunications myself, it was a real eye-opener to see the plethora of computer equipment on show. It was like an archaeological dig - there were dinosaurs everywhere. Extinct beasts such as Texas TI computers, lots of old Microbees, several Tandys, lots of Osbornes, IBM look-alikes and even a couple of VIC 20's.

One item which was conspicuous by its absence was the old faithful, Commodore 64, in fact there was only one C64 at the show. It was running a program which, along with some hardware, allowed it to communicate with other computers through the medium of radio waves. Yes, it was for sale, but it was not very cheap.

Packet Radio is the keyword, this is the name used to describe the method by which computers communicate over the air. A major advantage of this system is that, once you have the equipment, it does not need the cost of a phone call in order to log-on.

As with modem communications there are bulletin boards in all areas and if you do a bit of study and get your Limited Amateur Licence, you can gain access to repeater stations which form a network over the entire eastern coast and sometimes even further, such as overseas via satellites.

It is also possible to call other sta-

"A major advantage of this system is that, once you have the equipment, it does not need the cost of a phone call in order to log-on."

tions which may be out of range by utilising the computers of other operators in between and the method is so efficient that there is no chance of errors passing through because the receiving station will not accept the data if it is corrupt. I know that sounds hard to believe but I'll explain further.

The system is called Packet Radio because the computer arranges the data into orderly blocks (*Packets*) which are made up as follows: First a series of *flags* or markers to signify the start of a message. Next comes the call sign of the sending computer followed by the call sign of the receiving computer. The data is next, between 127 and 255 bytes, depending on the system. Then comes the most important bit, the *checksum*.

Now all us computer folks know what a checksum is, but just in case, it's a number computed in various ways by the computer and using the data as a base. It may be the sum of all the numbers being sent or a more complicated system of AND, OR & XOR - whatever system is used, it reaches a number and if the receiving computer does not reach the same number, then a data error has occurred and the receiving computer does not send out a confirmation to the sender, so it is sent again and again until it is confirmed by the receiver. After the checksum there are more flags or nulls

to signal the end of a packet.

All the above happens at an incredible speed, usually at 4800 baud or higher so if you are listening to a radio where packet is in use, all you hear is a buzz for about a second and then silence for a while and so on.

Another incredible thing about the system is the number of users that it can support. With normal phone modems, the number of users is limited to usually only one at a time on the bulletin board, but with packet, the computer 'listens' for a break in transmissions and in the break, transmits an 'are you there?' to the intended receiver. If it gets a reply, the packet is prepared and sent, again in breaks between transmissions. This leaves room for many users to be using the wavelength at the same time but if it gets too crowded, then you simply change hands to a quieter frequency.

The following scenario was used as an example at a seminar on Packet Radio held at the field day.

- *Step 1* Sydney station wishes to talk to Redcliff, north of Brisbane.
- *Step 2* Host computer in Sydney calls Newcastle via repeaters.
- *Step 3* Call received and packet sent, received okay, checksum okay.
- *Step 4* Newcastle computer info, calls Armidale via repeaters.
- *Step 5* Armidale replies, packet sent and received.
- *Step 6* Armidale checks packet, calls Tenterfield, sends packet.
- *Step 7* Data is scrambled by lighting near Gibraltar Range, not received.
- *Step 8* No reply from Tenterfield, data is re-sent, this time it makes it.
- *Step 9* Tenterfield calls Brisbane, packet is sent safely to Brisbane.
- *Step 10* Brisbane calls Redcliff, pack-

et is sent to the final destination.

The above scenario could have taken seconds or it could have taken minutes, depending on line traffic, noise, storms etc. The packet could have been sent straight through or it may have been delayed by errors on the way, it may even have been beaten to the final destination by packets from the same batch of information sent after it, but the host computers put it all together correctly at the end, otherwise our friend the checksum steps in and sorts it out.

The call signs of all intermediate stations are entered into the identification string of the transmitted packet so the messages go to the right stations along the way. The amazing thing is that dozens of users could have been doing the same thing at the same time and none of them incurring any line-charges!

There were some demonstrations of Packet. One particular guy, a real boffin, with a home-made dual 8" disk drive, had one computer transmitting through a dummy-load to another system using a

"The C64 is one of the best machines for packet."

wet piece of string as an antenna, (fair-dinkum!) he was sending screenfuls of files and programs at an incredible rate.

He suddenly strode over to one of his machines and started furiously typing, he seemed to be in control, so I sidled over to have a look. The other, meanwhile, was still spewing forth screenfuls of information so I innocently asked him if his machines were multi-tasking. He looked at me as if he knew I wasn't a VK and said "No, it's just emptying the buffers." The screens rolled on and on before finally stopping, when they did, the cursor appeared above "waiting". I noticed a baud rate of 19,200 listed as one of his options and mentioned it, also to be told "The system can handle it, the antenna

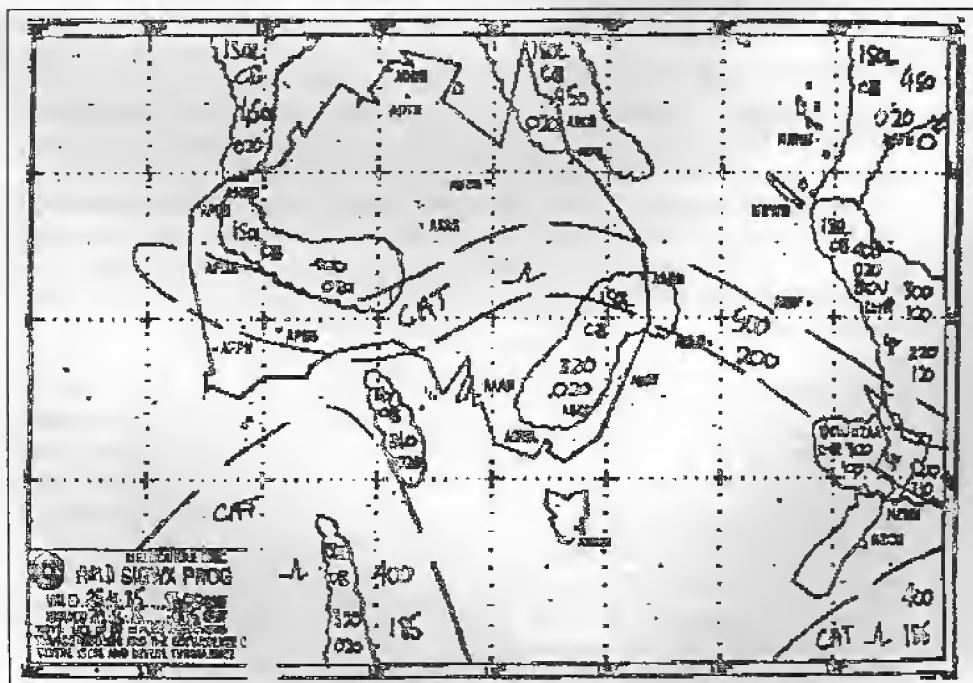
can't."

Some of the things that a computer can do when hooked into a radio are nothing short of stunning, such as FAX pictures and weather maps, all up to the minute stuff, test patterns from various stations and satellites, all you need is a good quality communications receiver to obtain these signals and a program or cartridge for your computer to turn it into a Terminal Node Connector (TNC) which is connected to the radio.

There are kits available to turn most computers into TNC's but the one thing I learnt from the field day (which is also the reason there were no second-hand Commodore 64's for sale on the day) is that the C64 is one of the best machines for Packet. Coupled with the ever-widening range of software and hardware available for this machine, it may be some years yet before we see them in any great quantities at the field days.

This was backed up by the gentleman conducting the packet seminar saying that C64 owners were the luckiest for they had the best machine for the job.

The market followed the seminar, and boy, was there some junk for sale, old valve operated equipment to Vic 20 cartridges, huge contraptions, dusty old chassis's with fabric covered wires, old tape recorders, lots of keyboards, 110 volt monitors with no cases, radios of all sizes, CB's, portables, trannies and much more. After a browse in the hall we adjourned to the Gosford Leagues Club for some light refreshments before catching the train back home. ■



Example of radio received weather map.

BeckerBASIC

by Frank Paterson

An enhanced BASIC for the C-64 and GEOS.

BECKERBASIC ARRIVED in the mail looking very impressive, and as it turns out, that's quite appropriate because this package is indeed impressive.

Nicely presented in a somewhat oversized box which slides out of a decorated sleeve, what you get for your money is a 240 page book and a nearly full single-sided disk.

The BeckerBASIC system is a very much enhanced BASIC for the 64, and is designed to be used with GEOS. There are over 270 new BASIC commands designed to give easy access to high resolution graphics, sound and sprites. There are also programs on the disk which will help you to create GEOS applications, such as construction sets for drop-down menus and dialogue boxes. This gives you the ability to make very professional looking programs without having to know all the details about the workings of the 64 or GEOS. To give you an idea of what can be done, there is a spectacular and comprehensive demo program on the disk.

The manual

On opening the book, two faults became apparent immediately. The first is the type of binding used to hold it together. This is supposed to be a reference book to be used alongside the keyboard for some time until the user becomes familiar with the language, but its paperback binding is done so tightly that it will not, under any circumstances, stay open at a page. Even after standing on it!

The second fault is that the inner margins on the pages are too small and as a result, the text tends to disappear into the spine of the book, making it difficult to

"The BeckerBASIC system is a very much enhanced BASIC for the 64, and is designed to be used with GEOS."

read and compounding the binding problem.

My usual fix for the "book that won't stay flat" is to take it to the local printer and have the spine guillotined off and the book re-bound with a comb binding (like spiral binding). However, it can't be done with this book because some of the text, being too close to the spine, would be lost in the necessary cutting and hole punching. A pity, because it is comprehensive and well-organised and is otherwise a good reference - it's just unnecessarily difficult to use.

The book contains an excellent 22 page introduction to BeckerBASIC, describing the three interpreters and why they are needed (more on this later). This section also describes the CONVERTER which changes your BeckerBASIC programs into GEOS files, and discusses the ability to rename BeckerBASIC commands.

Renaming commands

The last item is very different from most BASICs, and very convenient. Some of BeckerBASIC's words are quite long and as there are no abbreviations permitted, you can appreciate that it may become tedious continually re-typing an often used word or series of words. To allow you to adapt the language to your own needs and preferences, BeckerBASIC

provides a RENCOM, or Rename Command function. With RENCOM, you can rename any command to anything you like, as long as it is not another BeckerBASIC word or part word. The system creates a "command table" which links your command names to the correct functions. You can save your command name table to disk and recall it any time you need it.

If you write a BeckerBASIC program with modified command names, you will need to load the command name table before test-running the program so that you can de-bug and edit it when it stops. However, BeckerBASIC doesn't need the table in order to run the program because it doesn't use words. It uses tokens in the same way that BASIC 2 and other Commodore BASICs do. When you enter a line of BASIC, the Input System translates the words into numerical tokens. It doesn't matter what you call a token, it will always perform the same task. However, unless the tokens can be linked back to the words which originated them, you could never list your program in a readable form. The purpose of the command table, then, is to link your words with the tokens used by the machine so that the Input and Testing Systems can list your code when you want to see it again.

On the other hand, the Run Only system deals only with tokens and doesn't care a whit about what you have called them. It is smaller, more memory efficient and although I haven't done any tests to confirm it, I suspect faster than a full interpreter.

There is a limited amount of on-screen help available to help you find your way around the commands, and your renamed commands are automatically incorporated into that help.

The manual is divided into ten main sections, and commands are discussed under each section. The first one or two letters of each command generally give a clue as to its use. For example, all sprite commands start with MB (I suppose from Moveable Object Blocks or MOB, sometimes used instead of the word "sprite"). All sound commands begin with SD, from Sound interface Device; hi-res graphics commands begin with HR, etc.

There is an extensive section on structured programming, incorporating PASCAL-like PROCEDURES, global and local variables, enhanced branching to calculated line-numbers or labels or a mixture of both, etc. A BASIC programmer can now make his programs much more readable by coding lines such as

```
200 GOTO "OUTPUT" or
1000 GOSUB "UPDATE DATA"
instead of the rather meaningless
200 GOTO 4000
and the like, which BASIC 2 users are
limited to.
```

Also supported are IF/THEN/ELSE, WHILE/DO/ENDDO, REPEAT/UNTIL and LOOP/LPEXITIF/ENDLOOP. These can all be nested and there are commands for each which will determine the level of nesting at any time. For example, LEVELIF will tell you how far you are into a series of IF/THENS.

There is another construct which is new to me - SELECT/CASE/OTHER/ENDSEL - which may be used to simplify what could otherwise be complicated or clumsy IF/THEN constructions. For example the code

```
5 INPUT "NUMBER FROM 1 TO
6";WB
10 SELECT WB
20 CASE 1, 3, 5: A=1
30 CASE 2, 4, 6: A=2
40 OTHER SCPRINT "OUT OF
RANGE. TRY AGAIN"
50 ENDSEL
60 SCPRINT "A=" ;A
```

"To give you an idea of what can be done, there is a spectacular and comprehensive demo program on the disk."

takes an input from the keyboard, limits it to a value between 1 and 6 (with OTHER), and if it is 1, 3 or 5, assigns the value 1 to variable A. If the value is 2, 4 or 6, then 2 is assigned to A. The result is then printed to the screen (SCPRINT means "print to the screen").

In BASIC 2, it would look like this:-

```
5 INPUT "NUMBER FROM 1 TO 6";
WB
10 IF (WB<1) OR (WB>6) THEN
PRINT "OUT OF RANGE": GOTO 5
20 IF (WB=1) OR (WB=3) OR (WB=5)
THEN A=1
30 IF (WB=2) OR (WB=4) OR (WB=6)
THEN A=2
40 PRINT "A=" ;A
```

Note how much more readable the BeckerBASIC version is.

Here's another example:-

```
10 INPUT "NUMBER"; KN
20:
30 SELECT KN
40 CASE 1 :WT$="SUNDAY"
50 CASE 2 :WT$="MONDAY"
60 CASE 3 :WT$="TUESDAY"
70 CASE 4 :WT$="WEDNESDAY"
80 CASE 5 :WT$="THURSDAY"
90 CASE 6 :WT$="FRIDAY"
100 CASE 7 :WT$="SATURDAY"
110 OTHER SCPRINT "BAD NUM-
BER. TRY AGAIN!"
120 ENDSEL
130 SCPRINT WT$
```

This program reads a number between 1 and 7 from the keyboard, checks the range, assigns the corresponding day of the week to variable WT\$ and then displays WT\$ on the screen. (SCPRINT means "screenprint".)

In BASIC 2, it could look something like this:-

```
10 INPUT "NUMBER"; KN
20 IF (KN < 0) OR (KN > 7) THEN
PRINT "BAD NUMBER. TRY
AGAIN!": GOTO 10
30 IF KN=1 THEN WT$="SUNDAY":
GOTO 100
40 IF KN=2 THEN WT$="MONDAY":
GOTO 100
50 IF KN=3 THEN WT$="TUESDAY":
GOTO 100
60 IF KN=4 THEN
WT$="WEDNESDAY": GOTO 100
70 IF KN=5 THEN
WT$="THURSDAY": GOTO 100
80 IF KN=6 THEN WT$="FRIDAY":
GOTO 100
90 IF KN=7 THEN WT$="SATURDAY"
100 PRINT WT$
```

or perhaps a little more concisely

```
10 INPUT "NUMBER"; KN
20 IF (KN < 0) OR (KN > 7) THEN
PRINT "BAD NUMBER. TRY
AGAIN!": GOTO 10
30 ON KN GOTO 40, 50, 60, 70, 80,
90, 100
40 WT$="SUNDAY": GOTO 110
50 WT$="MONDAY": GOTO 110
60 WT$="TUESDAY": GOTO 110
70 WT$="WEDNESDAY": GOTO 110
80 WT$="THURSDAY": GOTO 110
90 WT$="FRIDAY": GOTO 110
100 WT$="SATURDAY"
110 PRINT WT$
```

or even more concisely

```
10 INPUT "NUMBER"; KN
20 IF (KN < 0) OR (KN > 7) THEN
PRINT "BAD NUMBER. TRY
AGAIN!": GOTO 10
30 DIM WT$(7)
40 WT$(1)="SUNDAY": WT$
(2)="MONDAY": WT$
(3)="TUESDAY": WT$
(4)="WEDNESDAY": WT$
(5)="THURSDAY": WT$(6)="FRIDAY":
WT$(7)="SATURDAY"
```


50 PRINT WT\$(KN)

Of the four examples, the first is easily the most readable and "structured". The last may seem more compact and efficient, but it is the least readable. While it is decipherable, it is easy to get lost in a page of such code, making it difficult to de-bug or modify at a later date, which is a problem that structured languages like Pascal and BeckerBASIC try to address.

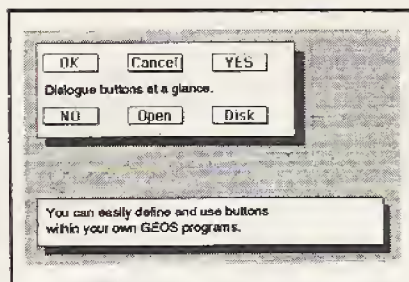
PROCEDURES

PROCEDURES are a subject in themselves. In a nutshell, they are self-contained program modules which use only the variables assigned to them (local variables). They cannot directly access variables used by the rest of the program (global variables), though there are ways of passing global information into a PROCEDURE and local information from a PROCEDURE out to the rest of the program. PROCEDURES can be saved to and read from disk, meaning that a running program can call a PROCEDURE from disk, run it, and then return to the main program. This could be useful if you had designed a suite of programs to handle an application and those programs used certain routines in common. Rather than repeating the common code X number of times, you could write it as a PROCEDURE, file it on the disk and call it as and when needed, from any program. Neat and elegant.

Interpreter

You may have wondered how all this fits into a 64k computer that is already comfortably full with GEOS. Data Becker, the designers of BeckerBASIC, have taken an approach not often seen in programming the 64. They have divided the BASIC interpreter into three parts, only one of which is loaded and operative at a time. This saves considerable memory, and the bigger the BASIC, the more memory saved ... BeckerBASIC is BIG!

Think about the three stages of writing a program ... First you type it in. Then you test and de-bug it. The final



stage is the completed product. BeckerBASIC has an interpreter tailored for each stage ... the Input System, the Testing System and the Run Only System.

You can easily change between the Input and Testing systems, so it is easy to adjust code on the Input System, test-run it on the Testing System and return to the Input System if necessary. Once the program is fully de-bugged and to your satisfaction, it can be run on the fully cut-down version of the interpreter, the Run Only System, allowing more memory for variables, etc.

If you wish to publish any of your programs, you are permitted by Data Becker and Abacus to include just the Run Only System on your distribution disk, with no obligation to pay royalties.

When any of the three systems are loaded from GEOS, you are left with about 16k of free memory. Now this doesn't sound like much, especially to you spoiled people who also work with IBMs and Amigas with megabytes of RAM oozing out of ports all over the place. However, BeckerBASIC addresses the problem by providing a program overlay capability. That is, instead of holding the entire program in memory and compromising on either the program or data storage or both, it's possible to write and store programs in modules which are then read from the disk as they are required.

This is not a new concept ... it's just not very common on the 64 because until now it hasn't been easy to do. BeckerBASIC makes it a snap with special overlay commands which read program segments into the beginning of BASIC memory without disrupting variables. Those segments can then be run, using

existing variables, and then a return made to the same or another part of the program, again using an overlay command.

More features

There are heaps of features in BeckerBASIC which I haven't covered here ... it would be impossible to do justice to them all in a magazine review.

Things like DEEK and DOKE which peek and poke PAIRS of locations - very useful when dealing with data in low-byte/high-byte format.

And the disk commands. Just about all the modifications seen in other BASIC enhancements have been incorporated, and then some. The usual simple commands DIRECTORY, DSAVE, DLOAD, DVERIFY and modified save-with-replace, etc are all there in BeckerBASIC, along with a comprehensive list of advanced commands covering direct disk access and disk memory access.

A few interesting ones are DMY-PEEK and DMYPOKE which peek and poke drive memory, DMYREADM which reads up to 255 bytes of drive memory and places it into the computer and FILENUM, which returns the number of files currently open to the drive. (You can have only three open at a time. FILENUM helps you keep track of what your program is doing.)

The more you look into BeckerBASIC, the more there is. In fact, there is so much in it that it is wrong to consider this product to be a BASIC enhancement. It is instead a complete replacement for the BASIC supplied with the 64. While I wouldn't recommend it for beginners, I will say that for the average programmer aspiring to higher things it will open doors to structure, inventiveness and satisfaction. For the accomplished programmer interested in writing applications to be run under GEOS, it is indispensable.

BeckerBASIC.

From Data Becker.

Published by Abacus and distributed in Australia by Pactronics (02) 407 0261 RRP \$99.95. ■

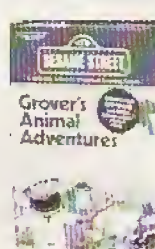
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Uncle Pete's latest Crossword Puzzle

The last crossword was another success, even though a bug crept in causing the clue for 5 down to be omitted. The typesetter has since been keel-hauled but is recovering nicely now.

The winner is Suzanne Parkes of Blacktown, who should enjoy the disk of games (all public domain of course) which will soon be on the way.

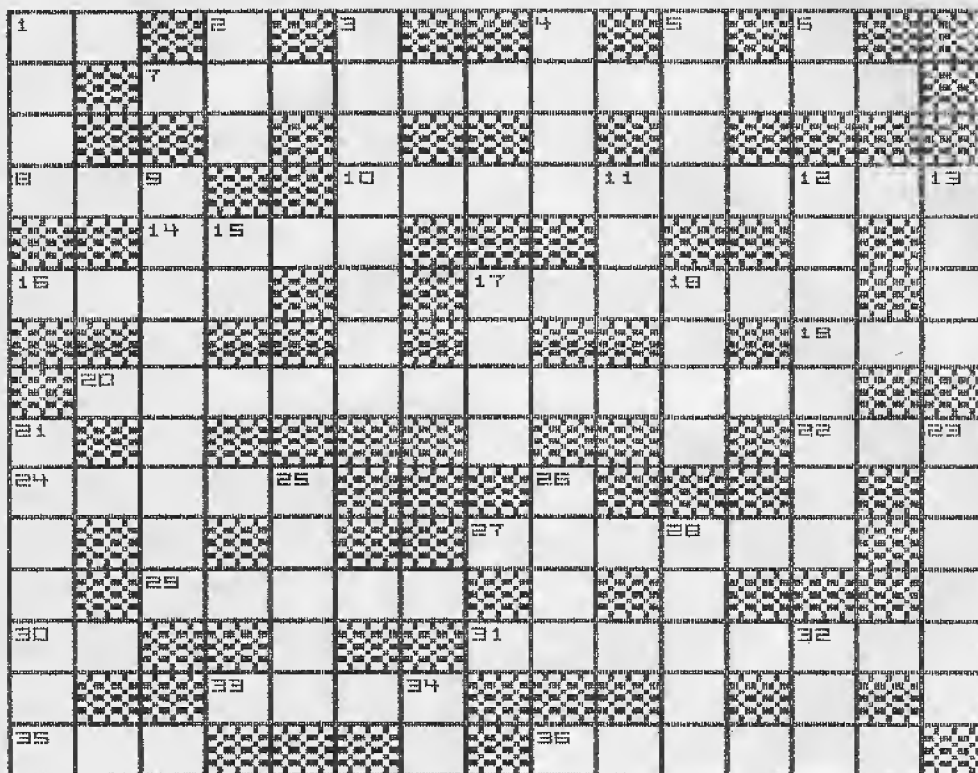
Suzanne also suggested a puzzle for adventure freaks. I'm pleased to say that is just what you are getting this month and the prize is, of course, a disk

of Uncle Pete's favourite adventure games.

My old shipmate Jolly Rodgers was also prompt with his entry and suggestions, along with Tim Glick of Dover Heights, who also rates a mention. Thank you for your response and I hope all enjoy the new one.

Send your puzzle to:

PO Box 4
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Across clues

- | | |
|------------------------------|--------------------------------------|
| 1. Bachelor of Arts (inits) | 24. Batman's buddy |
| 7. Holiday adventure game | 27. TV soapie and game quest |
| 8. Found in caves | 29. Found near fireplaces |
| 10. Easy Infocom adventure | 30. Adventure direction |
| 14. Throw | 31. Level nine game (7000 locations) |
| 16. Fabulous garden | 33. Direction |
| 17. River and adventure | 35. Every |
| 19. Famous magazine | 36. Three ring adventure |
| 20. First big adventure | |
| 22. Overseas Service (inits) | |

Down clues

- | | |
|------------------------------------|---------------------------------------|
| 1. Exploding device | 15. Negative prefix |
| 2. Powder container | 17. Spider game |
| 3. Nasty little critters | 18. Fervour |
| 4. Freezing | 21. Chap from Transylvania |
| 5. Red Herring is one | 23. Roll of paper (ancient) |
| 6. Command | 25. Japanese warrior |
| 9. Melbourne House adventure | 26. Heroes of |
| 11. Pool | 28. Underneath |
| 12. Underground location | 32. Australian Railways Union (inits) |
| 13. Found in paradise (level nine) | 34. Tourist Trophy (inits) |

Australian **Amiga Review**

- **Jump Jet**
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John Singleton Advertising, LCM1003

Editorial

The Virus - how dangerous?

MUCH HAS BEEN said about the dreaded Virus since we first published a warning some months ago. Some is complete and utter nonsense. There is a lot of erroneous advice floating about, mixed with a small amount of true to life explanations and solutions to the problem.

Yes, you can catch it without pirating software. And yes, it is unfortunately a user beware situation. But the most frightening question is just how many Viruses are there? More to the point, just how dangerous are they?

There can be no doubt that the infamous SCA-Virus is a real menace. SCA themselves say it was merely a "... joke that installs itself on disks that you put in the disk drive." However they also add "It is impossible for the Virus to become able to destroy any kind of program outside the boot block, such as source code or text files."

What SCA didn't count on originally was that many new programs arriving on the market would make special use of the boot block (a special sector on Workbench disks), using it to hide copy protection routines. Once overwritten by the Virus, the result is normally a dud disk that will no longer boot, or invokes the

Not A Dos Disk requestor. Such program include *Barbarian*, *Terrorpods*, *Outrun*, *Test Drive* and *Crazy Cars*. Unless you happen to have another copy handy to restore the original boot block from, you're up the creek. I have personally lost several of my games disks in this way.

To add insult to injury, the SCA Virus installs itself into a part of RAM called the STACK. However, the stack, depending on memory availability and concurrently running applications, may move around.

The SCA Virus can then end up living on top of code required by certain application programs. The end result, a GURU Error, or partial data loss.

However, that is not to say that every Guru error you see from here on in is the result of the Virus, as seems to be the attitude amongst some. Furthermore, the Virus can be contained, and with a little common sense, removed from infected disks.

So the Virus is very real. It is not the figment of some computer writer's imagination. You've read how it works. You know who's to blame. And so far we have only discussed the more popular SCA version.

We have published articles on removing this beastie in previous issues.

If you get really stuck, contact our editorial offices on (02) 817 0011 or con-

sult your local user group for a copy of the necessary utilities.

Alarmingly, there are other viruses starting to breed. These are nastier, and have been blatantly designed to destroy disks, and hamper removal. Once infected, they're tougher to kick.

One of the most infuriating is the Byte Bandit Virus. Attempts to remove it by the install command are thwarted in two possible ways. Either the command returns, with no operation taking place, or the sector is overwritten straight after it has been replaced - depending on which version you are unfortunate enough to end up with. By far the worst aspect is Byte Bandits symptoms. They're often mistaken for a hardware fault. Your Amiga will totally freeze, or just display a blank screen every two or three minutes. Reports of several machines returned for repair have surfaced where the problem stemmed back to infected disks.

Yet other Viruses are reported to congregate in Clock RAM of A500's and A2000's. A clock reset will rid the machine if the suspect code. Worse still, sketchy information suggests that the Spirit RAM expansion board may in some cases be harbouring a Virus that can only be removed by physically shorting out the battery. In both cases watch for a sudden change in the correct time.

Andrew Farrell

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Contents

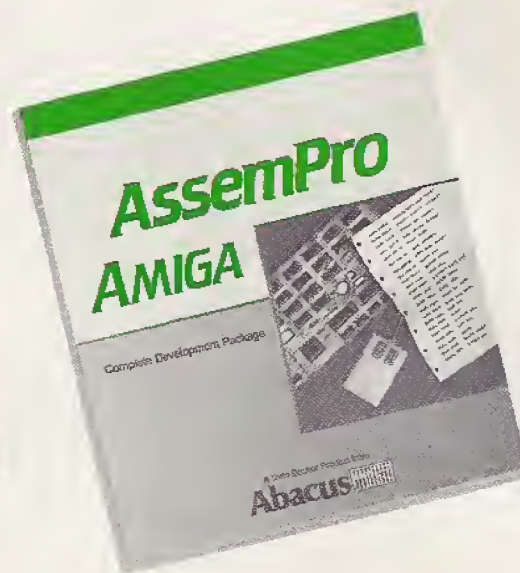
1. Editorial - The Virus - how dangerous?
4. Notepad - What's happening, new products
5. Acquisition . . . the update - version 1.3F with amended manual and a third disk
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Notepad



Notepad

Amiga the Movie

First came the highly successful Amiga 500, now there's the movie about it...

Commodore has announced the release of the *Amiga the Movie* video available from the end of April at any Commodore dealer.

Commodore Managing Director, Mr Tony Serra said, "Because the Amiga 500 has so many different features and applications and is so time consuming to demonstrate, it was decided to make a video instead."

Amiga the Movie allows prospective Amiga 500 buyers to see all the features of the system in the comfort of their own homes.

In launching the *Amiga the Movie* video, Commodore has announced a special offer. The video is available for just \$20, refundable if it is returned to Commodore dealers.

Bonus software worth \$200 is available to those who buy the video and subsequently purchase an Amiga 500.

In the US, there were more than 30,000 inquiries for the video. Figures to date show that 50 per cent of those who saw the video subsequently bought an Amiga 500.

"*Amiga the Movie* has been described by some who have seen it as 'awesome'," said Mr Serra.

Commodore/Ozi Soft agreement

Commodore Computers and Australian software company, Ozi Soft, have announced a multi-million dollar joint marketing agreement.

The move follows lengthy talks between the two compa-

nies since the beginning of the year. The agreement will significantly enhance the companies' sales forces and will allow each to share the others' selling resources and extensive dealer base.

The agreement extends throughout Australia and the Asia/Pacific region, which encompasses more than 20 countries and involves more than 2,000 dealers.

Commodore Australian and Asia/Pacific Managing Director, Mr Tony Serra said, "It is one of the few major joint marketing arrangements between an international computer manufacturer and a major software supplier. The agreement is expected to result in sales increases of up to 15 per cent."

Ozi Soft Managing Director, Mr Kevin Bermeister said, "The agreement will consolidate Commodore as the number one hardware supplier and Ozi Soft as the top software supplier in the home entertainment end of the computer market. This venture will also extend marketing campaigns by both companies into the business PC market too."

For the consumer, the agreement will result in lower prices and a broader range of product available through a larger number of outlets.

New Products

● *Deluxe Productions* for the Amiga 500, 100, and 2000 is a professional quality, high-resolution video presentation program for use in the creation of computer-generated business and educational presentations, live television broadcasts, and demonstrations using video.

The program allows users

to create up to 12 scenes per production, each scene containing up to five clips, each clip containing one animated object. The user can over-scan and chain productions together to create long or looped presentations.

Play capabilities, including pause, forward and backward functions, allow the user to maintain complete control over any production. Double buffered animation, a colour palette of 4096 separate colours, and a selection of over 40 wipes provide flexibility in special effects decision making. The program retails for \$229.

● *IntelliType* for the Amiga is a typing tutor program that uses sophisticated artificial intelligence (AI) and an adventure story to teach typing to adults.

Users are enticed to go to the next lesson because it's another cliffhanger episode in an action-packed thriller. There are death-defying stunts, sizzling sensuality, careening car chases, witty

banter, and a storyline.

The program monitors 27 different kinds of typing errors in nine categories, including dyslexia errors, high keystroke variance, transposition errors within or between hands, and near and faraway key insertion errors. It even recognizes when users shift with the wrong hand.

IntelliType analyzes typing with bar charts that show accuracy, speed, and error types. Mouse clicking on any bar results in an in-depth analysis of each error type which reports such data as how many times the error occurred during the lesson.

● *Ferrari Formula One* for the Amiga is a detailed driving simulation that allows players to live out the high-speed fantasy of racing a Ferrari F1/86. It offers high-speed action on authentic recreations of 16 international race courses. RRP \$59.95.

The above three programs are distributed by ECP (075) 963488.

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Acquisition . . . the update

by Ian Preston

Avid readers of this magazine have no doubt been waiting in anticipation for the second part of our review of *Acquisition* by Taurus Impex.

TO RECAP THE story so far: *Acquisition* appeared to be a powerful piece of software that had me snookered; a manual that made no sense and two disks of program code that seemed to have a permanent booking with the Guru.

Since then we reported in our *Amiga* 1.3F has been released with amendments to the user manual containing examples of the promised 200 pages will not appeared.

Manual

Although the manual updates show a marked improvement over the original literature, Taurus would have been well advised to re-write the whole manual. The update involves the "remove and replace" method except in the "Acom Language" section which as Taurus states is "an update section of the command syntax (which is) NOT inserted into the existing Acom syntax section, but treated as an appendix". More's the pity, a full revision would have made the manual far more accessible.

I hope that whoever proofread the manual didn't give up their other job. We all know that programmers can't spell but the manual (including update) is riddled with "typo's". A solid background in adventure games is recommended if you intend to seriously attempt to digest the contents of the manual.

But enough of the manual (who reads them, anyway). We'll have a go at the software:

A BIG plus is they've dispensed with the dreaded dongle protection scheme. The software is presented on two unprotected disks: MAKE and FILE. Although the manual indicates that both of these disks boot from the Workbench prompt,

in fact only the MAKE disk does so. The first step is to create a data disk, (you can't get any further without it), which lives in DF1:. By the way, unless you have an external drive or the luxury of a hard drive, *Acquisition* is unusable.

Whilst on the subject of data disks, make plenty of them. I'll explain why later.

The Make disk

The Make disk contains the programs MAKE, BRIDGING and PASTING. Step one is to load the MAKE program. Here you define the basic DataBase . . . that is, its fields, and here the reason for the ample supply of data disks becomes obvious. You may only use a field name once; not only in the database you are working on, but ANY database on the disk. We are creatures of habit and have our favourite names for variables, subroutine labels and the like. I guess 99 per cent of the databases I've set up over the years contain the field "NAME". With *Acquisition*, if you have the same habit, it's a new data disk every time you start a new project.

You must have a unique key field (duplicate keys are a no-no), but that's the only restriction. Field lengths are dynamic. After defining your database, you save to disk. A word of warning: the manual claims that you can change a database definition at any time (that is, add another field), experience has taught me to get it right the first time (especially in the Pasting stage) as attempts to alter a database definition once it has been set up can lead to many hours of lost work.

Bridging

The next step is Bridging. To quote Taurus: "This module is used to create PATHs that connect Database Files to

other Database Files, and add system indexes." A simple explanation that I will not even attempt to enhance on. It only becomes a worry when creating several "Child" databases of a "Parent". As an example, here's how Taurus explain it: ". . . each PARENT record is related to its own set of CHILD records and cannot access other CHILD records with the same PARENT value." Simple! That's enough Bridging for the time being, I get confused just thinking about it.

Pasting

The next stage is "Pasting", and again from Taurus: "This module is used to glue everything together and customize the user interface. Pasting is where the user decides what a record will look like cosmetically and how it is to be formatted, searched, selected and used. The PATHs created in Bridging are installed here between the Database Files that need to be related." My only real problem with this one was that although you can move the field name around the screen (sorry, I mean the interface), the system still thinks the field contents will be input where the field was originally; in other words the field name can be bottom left of screen but the data must be input at top right. I must admit I didn't persevere with the problem so a solution may exist.

During Pasting you may also append a "Stream" to a field. For example, the stream NAME=UPPER(NAME) would convert the contents of field NAME to upper case at time of entry, NAME=PROPER(NAME) would capitalize the first letter of each word. A stream will also perform arithmetic calculations eg: TOTAL=QTY*PRICE. This stream will place the product of the fields QTY and PRICE in the TOTAL field. Fields can

be "protected" from user input to safeguard the results of calculations.

The File disk

With a bit of luck your database is now ready to take data. This is input through the Filing module which is on disk two. Getting the data in is relatively easy and is only stored on disk when the buffer is full, so things move along fairly swiftly. With all buffered input though, you MUST close the database down tidily, a CTRL,AMIGA,AMIGA will cause considerable data loss. Once the data is loaded, you may scroll through the records using mouse driven icons but to get the information onto paper you must use...

The Report module

Again on disk two, the Report module allows the formatting and execution of printer output. I was impressed with this easy to use, powerful utility that allows the data to be printed in just about

any format you can think of.

The report generator contains such commands as AVE (returns the moving average of an expression by page or whole report), COUNT (returns the moving count of an expression), END REPORT (ends report unconditionally), LINE NO (returns the current line number within a page which the report is on), PAGE BREAK (forces an unconditional page break within a report), PAGE NO (displays the current page number that the report is on), SDV (returns the moving standard deviation of an expression) and SUM (returns the moving total of an expression). If that's not enough there is also:

*** SETUP All text is processed but no output

*** COMMENT All text ignored

*** HEAD Text only processed at start of report

*** PAGE Text processed at the start of each page

*** MAIN Text processed on any 'read'

to database

*** FOOT Text processed at the end of each page

*** TAIL Text only processed at the end of report

S Justification Block start

T Justification Block end

D Blank line if result is null

B Trim spaces from beginning and end of section or line

F Fixed field format

C Centrally justify section, line or block

R Right justify a section, line or block

L Left justify a section, line or block

P Forced page feed

The result of this array of commands is comprehensive reports that are easy to format.

Acom

Available through the filing module is the Acom Language interpreter which sets Acquisition apart from the common

Amiga Software

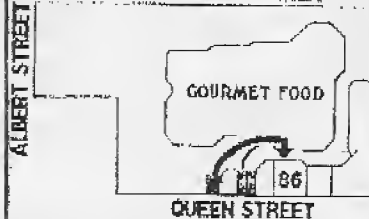
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sets *Acquisition* apart from the common database. Acom allows the control of the database(s) through user written (BASIC?) programs. It's possible to set up a Menu driven database where the end user never sees the actual database screen.

Reports (screen and printer) can be generated using the Acom, thus the user can perform complex calculations, sorts etc. and get it all on paper in report format with one keystroke. In other words you can make your databases "stupid proof", great if the wife needs to use it. By appending a stream to the database name, an Acom program can be loaded along with the database which runs but which cannot be listed. Very handy if you intend to write an application database for which a few dollars may change hands!

I found two drawbacks with the Acom. Both minor, and with practice they become insignificant.

The first is the manual. Typo's in a syntax reference manual can cause considerable frustration. By experimenting you eventually find the answer; again previous adventure game experience is an advantage.

The second point is the choice of command names. Many conflict with BASIC conventions, for example PRINT will generate output to PRT: (in other words the printer) where PRINT_AT(x,y) will output to the screen. Once familiar with Acom these problems don't slow you down too much but they can be annoying when you attempt your first project.

Speed

Probably as a result of AmigaDOS as much as *Acquisition*, drive access time starts to stretch out if your database assumes any size; especially if your data disk is starting to fill up.

I formatted a trial database with four fields and entered data into 1000 records using a simple FOR-NEXT loop in Acom. Each record length was six characters. The program run time was 12 minutes and 12 seconds writing to a 50 per cent full disk in DF1:, the same run took 4 minutes 19 seconds on the hard drive. The read back (using the same method)

was 5 minutes 46 seconds on the floppy, 1 minute 42 seconds on the hard drive. To delete the records from the hard drive took 8 minutes 25 seconds but the next write to the hard drive went out to 7 minutes 45 seconds.

Acquisition recommends that you should "Housekeep" your data disk regularly with the utility program supplied. I agree.

Another annoyance rather than problem is the method of changing data disks (remember the one database, one data disk problem). The data disk must be ASSIGNED, either through the Startup-sequence, the CLI or by using a utility program provided. I found a simple batch file the best solution.

A final word on data disks: NEVER let your data disk fill. If during a write, the data disk reaches 100 per cent, the system crashes and ALL data in that database is lost. Be warned!

Although it's a bit of a pain having to load three different programs to create and format a database, the real annoyance is the inability to generate printed reports from the File program. Swapping between File and Report (to enter data and print reports respectively) can become tedious. The solution of course is to write an Acom routine within the File program to crank up the printer; but the incorporation of the Report program into the File program would have been a far neater solution.

Crashes

System crashes are far less frequent with this version of *Acquisition*. I have only struck three guaranteed ways of meeting the Guru so far. One is the full data disk as mentioned above, the second is clicking the icon to load the Pasting program too soon after closing down the Create program, (even though disk activity has ceased), and thirdly, *Acquisition* is RAM hungry when you start using custom screens and the Say command. Sometimes a system requester will gently advise you of the problem with no drastic results . . . sometimes. If you are using an unexpanded A500 or A1000, be prudent with memory usage, the Filing program for instance is nearly 200K of

code.

The Examples disk provided with the V1.3F update is worth a good study, especially when the manual fails you. The Acom programs are well REMmed but there are no clues as to how the example databases were Created or Bridged. I assume the long overdue tutorial will remedy this.

To anyone contemplating using *Acquisition* make sure that you obtain the updates with your purchase. The earlier versions are of no use to you. If your retailer doesn't have the update, tell him Commodore has, and you are not interested until he gets it. Make sure you have a good supply of blank data disks and to get full benefit of the program, plenty of RAM. Finally, and most importantly, make sure you have plenty of patience. Don't expect to have the ultimate database set up overnight.

Conclusion

I've spent many hours with *Acquisition* and would be the first to admit that I've only just scratched the surface of its capabilities.

Acquisition is not for the beginner and if another database comes along that offers the same power and flexibility I would certainly consider using it as an alternative. Once the database is created, the Acoms written and the reports formatted, *Acquisition* is an excellent database, but getting to that point can be hard work. Such a powerful piece of software deserves quality manuals and I would be hard pressed to recommend the software until that is resolved.

In summary, *Acquisition* fills a gaping hole in the type of software available for the Amiga, but it may only be a temporary solution until something better comes along. Stay tuned for my review of *Superbase Professional* as soon as I can get my hands on a copy.

As a postscript, I must thank Matthew of Commodore's product support team for his assistance.

Acquisition is distributed in Australia by Commodore Business Machines. Review copy (and updates) supplied by that company. For information call (02) 427 4888. ■

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Amiga books

Two new books are now available for the Amiga, *Amiga for Beginners* and *AmigaBASIC Inside and Out*. Both are published by Abacus, distributed by Pactronics (02) 407 0261 and are available from larger retailers.

Amiga for Beginners

This book makes clear all the things that the Amiga manual just leaves in the dark and that can be a problem for an inexperienced computer user. Everything from complete set-up instructions to creating your own icons are covered in this useful text. Valuable topics such as how to customise your workbench and a general introduction to the CLI and AmigaBASIC are covered well.

The book takes a hands-on approach to solving the average user's problems with a Problem/Solution style format.

The book would be extremely useful to those who cannot quite grasp all the workings of the Amiga, as well as being helpful to more experienced users, RRP \$39.95.

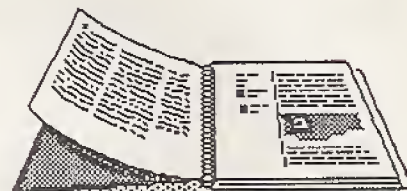
AmigaBASIC Inside and Out

Not only does this manual provide an advanced guide for any one interested in getting the best out of AmigaBASIC, it is a tutorial and reference all in one book.

The book covers the entire range of AmigaBASIC through the presentation

and explanation of various applications programs. Such as graphic demonstrations, animation, video titling, database, paint program, chart utility, speech utility and a synthesizer program to create custom sound effects and music. Many program listings are included for demonstration and use.

This represents a very comprehensive volume that would prove invaluable to a budding AmigaBASIC programmer, RRP \$49.95.



Karting Grand Prix -

KEEP IT SIMPLE. That's my favourite game. Easy to pick up, but hard to master - *Karting Grand Prix* falls into that category. Best played in multi-player mode, the game captures all the clichéd thrills and spills of the Grand Prix racing circuit in Go-Kart mode.

The production begins with a rock'n'roll tune, with lead guitar bellowing out . . . it doesn't take much to notice that the tune repeats itself every five seconds, but then's the limitations of digitisation.

On screen is what Grand Prix racing is all about. On the track, inches from the asphalt. However, *Karting Grand Prix* is a far cry from this down to earth view. Instead, you're given a bird's eye angle of the track. This makes picking your line through the corner much easier, but it also limits just how much track

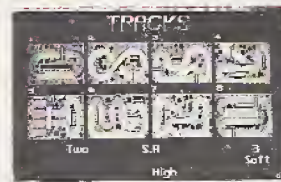
you can put on the screen. As a result the courses are fairly simple, but very challenging nonetheless.

There are eight to choose from in all, and three difficulty levels. You can only play at professional if you manage to win a particular class.

Before each competition, you're welcome to have a few practice runs. You can also change between a low, medium and high ratio sprocket, giving various degrees of acceleration and top speed.

Tyres may be either hard, medium or soft, and the road surface dry, wet or icy.

The action is fast paced, and thanks to the digitised sound effects of engines rev-



ving, and cars squealing and crashing, the game is a lot of fun. In fact, I'd rate it as one of the most entertaining games from Anco to

date. There are a few bugs, or glitches, but nothing serious.

You can spend a lot of time trying to perfect your line through the corners, braking and turning at just the right moment. *Karting Grand Prix* is one title that will be played many times on my Amiga.

Overall a top game. Recommended for car racing enthusiasts. Great for parties!

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Clicked on games

Hunt for Red October

TOM CLANCY's book provoked much controversy as to its content and whether it should be published, now *Hunt for Red October* the new computer game has aroused almost as much interest in the computer entertainment world. However, this is for a different reason. The high quality of the game has made it one of the biggest sellers in the short time it has been available, so it was with great expectations that we received our copy hours before our deadline.

For those who don't know . . .

Red October is the latest Soviet nuclear ballistic missile submarine. Armed with 26 SS-N-2 Seahawk missiles, it is capable of destroying 200 cities. It is also the first submarine to be fitted with the unique caterpillar propulsion system which is nearly undetectable.

You play the part of the captain of the submarine, a Russian wishing to defect from Russia. The simulation starts when Red October is about to negotiate the Rykjanes Ridge off the Icelandic coast. This area is the major route for Soviet submarines leaving the ports used by the Northern Banner fleet for the Atlantic Ocean and the US coastline.

To navigate this needs great skill as the US and NATO have concentrated their submarine detection networks on

this area. The objective for the player is to navigate to the Atlantic, rendezvous with the US Navy away from the Soviet fleet and arrange a transfer of crew. This allows the US Navy to create a suitable subterfuge about the fate of Red October to allow them to smuggle the vessel secretly to port. To sail Red October open-



head to Cuba on a courtesy visit. Designed to disguise the true intention of the mission as well as tantalise the crew with the excitement of the Cuban visit, the orders are far removed from those originally given to you by the Political Officer.

You must take into account that the Soviet fleet's only aim is to prevent Red October from falling into American hands - if it is necessary to destroy Red October then it will be destroyed. The graphics are superb and the game play com-

- A - Main display window
- B - Main control panel
- C - Sonar Officer
- D - Engineering Officer
- E - Weapons Officer
- F - Periscope
- G - Main display control
- H - Message Window

plex without being impossible. The forty page manual is filled the essential information rather than twenty pages of storyline and three pages of actual game information.

Hunt for Red October is unique in that it is the only simulation I know that has an actual theme to gameplay, this gives the game purpose and makes play more realistic and tangible. *Hunt for Red October* is a real winner, and has our stamp of approval. Distributed by OziSoft (02) 211 1266 RRP \$39.95. ■

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Thunder Boy! by Andrew Farrell

Normally we have a strict policy of reviewing only crash hot titles that are likely to get clicked on often. *Thunder Boy!* is an exception, but not without good reason. It looks and sounds every bit as good as the original C64 classic it is no doubt modelled after and of course the arcade game, *Wonder Boy*.

However good the graphics may be, and the music, there is no excuse for such a poor effort in animation and movement. Both are totally unsynchronised. The result is that your thunder boy is more like an ice dancer, slipping and sliding about

the place like he's standing on ice. This game falls in to the "You've Got to Be Kidding" category. Really, this is not by any means comparable with the arcade classic. To top it off, I'd rather play the C64 version - it's more like the original.

In a stroke of objectiveness, I had to admit the game wasn't all bad. It contains some excellent music. I considered just sitting and listening to it, especially once I'd had a play of the game itself. *Thunder Boy* is more like *Blunder Baby*.

Don't waste your money. This one has my official canning. Distributed by OziSoft (02) 211 1266. RRP \$59.95 ■

Jet

a sublogic simulation

YOU'VE WAITED. *FS-II* was good, would *Jet* be better? The one element hard core aero-addicts didn't get in the original was weaponry. Missiles and bombs. If that's your scene, this game has got the cream. If you're not into blowing things up, you can still enjoy the thrill of lifting off from an aircraft carrier and watching the runway disappear behind you.

Flying a jet is a big leap from the humble Cessna, and a fair step from the comforts of a Learjet. Heads up displays are the go. The instrumentation is more complex, but the aircraft itself is far more forgiving. She handles like a helicopter, and at times it seems there's no way to crash, without the help of enemy fire.

Scenery is spectacular. A quick run through demo mode will give you a taste of all the better features. You can view the world from your cockpit, or a variety

MIG-23



- Appears BROWN
- Encountered more frequently in high skill level games
- Fast
- Highly maneuverable
- Atoll missile equipped

of other positions, including the warhead of your favourite missile.

Multi-player mode is supported, so you can meet interesting people and then find ways to shoot each other down. Night flying is hard to master, but offers some excellent new features, such as stars, and a rather contorted looking moon.

My only complaint is the sound. Still a bit wimpish for a full-blown jet. But this baby handles. Name your stunt.

Flying upside down without a jitter is no problem.

The F-16 can generate more pounds of thrust than it weighs in at, and is therefore considered ballistic. That means vertical acceleration, and any angle of controlled flight. What could be easier?

Your plane casts a shadow as you strap down to land. From a third person's viewing point you can even watch the undercarriage pop down. To top it off, if you decide to crash in midair, you can eject. Your man floats softly to the ground in an animated parachute sequence, which although not rivalling *Gee-Bee Air Rally* for colour and humour, is a tad more technically accurate.

Overall, another excellent piece of software engineering from the people who aren't easily outdone. Whilst the thought of teaching the elementary requirements of a fighter pilot to your kids doesn't exactly excite me, the flying alone is reason enough to purchase this package. Use the sidewinders if you must.

Distributed by OziSoft (02) 211-1266. RRP \$99.95.

Jump Jet

Anco have brought out quite a number of new games for the Amiga, Adam Rigby previews one of the latest.

THE HARRIER *Jump Jet* is one of the most difficult planes to fly and once mastered is one of the most effective weapons in combat, as the Falklands war displayed. Anco have made flying the *Jump Jet* only a simulation and an Amiga away. Now for a meagre \$40.00 you can fly the *Jump Jet* in combat and normal flight simulations from the convenience of your desk.

Upon booting the game, after a pleasant title page a very "toffy" sounding chap said "Ready for take-off".

I replied with "jolly good show" and proceeded to increase the throttle and direct the thrust to a vertical position and the Harrier started to lift off ever so gracefully. All the landing and take off

scenes are viewed from above the landing platform and then after the aircraft has safely left the vicinity of the carrier a standard 3D view is return to normal.

Flying the Harrier is not at all like flying your average simulator. After all not many planes can fly sideways or even backwards. If you hover you can quite easily just move left and right, although such movement will lose you some altitude, so you have to compensate by increasing thrust.

The overall difference in flying the craft is angling the thrust output. Your jets can be angled four different ways from full ahead through to half ahead, hover and backwards. This can produce some very interesting results in flying

technique when used with a little accumulated skill.

One of the main stumbling blocks in this game is to adopt a particular technique to engage your opponents in combat, because certain methods will only end in failure. For example, chasing your adversaries for long periods of time on full thrust will very quickly use up all your fuel and you will just disappear into the ocean. Not a very prestigious way to end a promising Navy career.

The only way to succeed in this game is to learn and utilize the different ways that a Harrier can fly and use this knowledge to the best of your ability.

Overall this game didn't impress me nearly as much as other recent releases on-the Amiga. The scrolling is not as smooth as it could be, but if you think that flying a Harrier is your "cupper tea" then this package is the only way to go.

Distributed by Imagineering, (02) 697 8666. RRP \$39.95. ■

DESTROYER

Epyx have brought out some classics on the C64, now they have moved up to the Amiga. Captain Rigby reports in and tells us how they did with their new game called Destroyer.

THERE IS SOMETHING about sailing the seas in a vessel all your own, in charge of a crew, that inspires great interest in many a man. A man that longs for salt in his blood and the sea spray in his face. Not so long ago many were satisfied with a game called *Pirates*, now for those with a more modern dream this is a new piece of salty software that will fulfill your marine motivations. After that ridiculous lot of aliteration you might be wondering what

this game is all well... read on my, comrades.

Destroyer is set in World War II. Not a very pleasant scene, however you cannot command a destroyer with any great purpose unless there is a war going on. You can choose the mission that appeals to you the most, anything from a Submarine Hunt to a Rescue. In all there are seven types of missions, as follows:

Subhunter — You're to seek and destroy an enemy submarine that has been sighted in your patrol area. Use your sonar to track the submarine whilst manoeuvring towards it. When your ship is directly above the submarine use depth charges to destroy it. Stations used: sonar, radar and appropriate weapon systems.

radar, anti-aircraft guns and navigation.

Scout — An important convoy must cross a treacherous strait. You are to scout the intended route for enemy patrols. You will be notified as you reach each check point. Maintain radio silence until you return to base to make your report. Avoid combat and keep the enemy guessing to as your intentions.

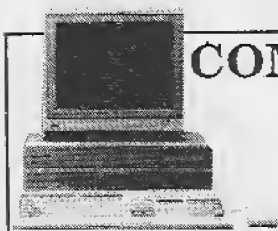
Bombardment — The marines are landing! You must shell key parts of the island and manoeuvre close to the beach to search for flashes of enemy gun emplacements. Silence them with your main guns, avoid their return fire, and destroy any enemy aircraft threatening the invasion beaches. A combination of good radar operation, keen lookouts and sharp shooting will be necessary to protect the amphibious assault.

Blockade runner — One of our small island outposts has been surrounded by enemy forces. The garrison requires certain critical supplies in order to hold out. You are to take battle seasoned crew and run the blockade. All stations must operate at full efficiency as you will be facing multiple threats from ships, submarines and fighters.

Navigation — Convoy Escort. You have been assigned to lead a slow merchant convoy to a beleaguered outpost, deep in enemy territory. Your assigned position is the left front sector of the convoy advance, your sister ships are assigned to other areas. It is your responsibility to run interference for those ships and to see the convoy safely to the harbour on time - regardless of enemy action. Stations used: All.

Screen — Your task force has been positioned south of you. To the north are a large number of enemy aircraft heading toward your carriers. You must protect them at all costs. Your radar will give you warning of the airplanes before they are on you, so you can ready the anti-aircraft guns in time to defend yourself.

Rescue — A friendly pilot has been



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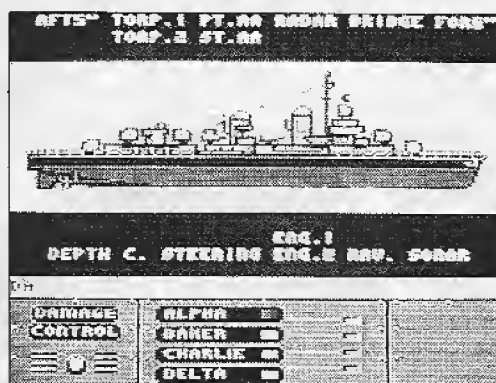
shot down in your area and made it into a small chain of islands. You must rescue him soon (his signal beacon is getting weaker) and get him back to base. As his position is behind enemy lines, speed and stealth are very important. The pilot will signal SOS with a mirror when he sees you approach, but beware, that flash might be enemy gunfire. Stations used: All.

The various stations mentioned above are the components of the game that allow the player to control the simulation. Also various elements such as radar and sonar are obviously used to convey information to the player. Moving between the stations is a very easy task indeed. All you do is type the first two letters of the stations you wish to attend, the disk drive whirs and you are there.

The stations are the following:

Navigation — This is where you can plot your course and get an overall picture of your patrol area. All islands and landmarks can be seen in this mode.

Bridge — The bridge is where you can



control such things as the status of the crew, the auto navigation computer and the status of the weapon systems.

Observation deck — This position gives you a view of the surrounding area, from here you can look in any direction and see the various enemies that you may be near.

Radar — allows you to spot enemy ships and aircraft at quite a reasonable distance. Other physical features such as islands will be picked up by radar as a matter of course.

Sonar — essentially the same as Radar except it is the only way to detect sub-

marines, and it will not pick up any aircraft at all.

Other stations are - guns, forward and aft, anti-aircraft guns, port and starboard, torpedoes, port and starboard, depth charge and damage control.

As you can see from this brief list, the range of tactics that can be used in the game covers quite a variety. This is definitely a good thing in any game and helps keep interest long after the novelty of the game wears off.

Graphically the game is good, not outstanding, and represents the various stations during the game quite well. One complaint is that ships and obstacles when viewed from the observation tower are lacking detail. Apart from this the game stands up quite well graphically.

I thought that it compared well with other games on the Amiga. If you like simulation then you will probably like this one quite a lot.

Distributed by Imagineering (02) 697 8666, RRP \$59.95. ■

Amiga tutorial

A beginner's look at the CLI

The CLI is a finicky interface between the Amiga and its owner. Once mastered it can provide you with endless hours of fascination. Simply learning about the idiosyncrasies of AmigaDOS and the CLI can be a combination of frustration and enjoyment, after all isn't that what computing in general is about?

This article is written under the premise that the user has access to only one drive. A lot of the frustrations of the CLI can be relieved by purchasing a second drive, but then what is easier to cope with - a smaller bank account, or frustrations that to a point, can be overcome?

When you first set up the Amiga and start clicking away merrily at different icons (little pictures) and little pictures (more icons) pop up everywhere, you are

amazed. I know I was and still am some 12 months after purchasing the machine. This does however provide limited opportunities to really explore the machine and some of its uses, the CLI or Command Line Interface is really the only answer. This method of accessing the machine, in combination with the WIMP interface, is all you will need to know to start doing some amazing things with your Amiga.

The standard Workbench disk (V1.2) provides the user with a surprising array of commands, some you will use all the time and others you will most likely never use. After you are in the CLI (for new users, look for the CLI icon in the SYSTEMS directory and double-click the icon, the same as most other applications. The CLI simply multi-tasks with whatever you are doing at the moment)

you can start typing commands, for a look at the commands simply type:

DIR DF0: C

C being short for Commands, this is usually the directory that AmigaDOS looks in for its commands. Actually DOS looks in the current directory and then the C directory then any other directories specified in the PATH command (more on that command later). So there you have in front of you all the CLI commands that are available on the your Workbench disk. There are also some other commands in the Systems directory; format, diskcopy, etc. For a quick peek simply type:

DIR DF0: S

And voila! more commands.

How does the computer know where to look for these commands? You tell it! But I haven't told it anything! *Au contraire*. By entering:

TYPE S/STARTUP-SEQUENCE

you can see exactly what you told the computer to do when you inserted the

Workbench disk. The STARTUP-SEQUENCE is a file that the Amiga always looks for so that it knows what to do. This lets you customize the Amiga so it can do whatever you want when you insert the Workbench disk (much like the autoexec.bat file in MS-DOS).

So let's start with some experimenting, type:

DIR DF0:

There you can see all the names of the directories and files/programs on the disk. DIR along with many of the other commands gives you options on how to use the command, for example type:

DIR DF0: OPT A

You now have a complete breakdown of the entire 'tree' structure of all your directories and files/programs. Type LIST and another structure of directories etc. appears. This list is however not alphabetically sorted like the format DIR DF0: produces (confused yet) but does however provide you with a lot of extra interesting information, such as date of creation, protection status etc. (If you want to ask a question (help) about the command simply type the command followed by a question mark. Out pops a lot of goobledy-gook about the command that provides information which in time you will be able to decipher.

Now, take your Workbench disk out of the drive and place any other formatted disk in and type:

DIR DF0:

"Scratch, scratch, it's asking me to insert Workbench back into the drive", so complying with the requestor, you do and lo and behold the list of DIRectories on the Workbench disk appears again. Fairly bloody useless, because you wanted to have a look at the contents of the other disk. Why is this so? Type ASSIGN and find out. See how the C directory is ASSIGNED to the Workbench disk. Because every command has to be loaded into memory before it is used, the system needs the Workbench disk to load the command from, (simple hey!) and then seeing that the Workbench disk is in the drive you get to see its contents. There is

a way round this, if you know the name of the disk you can type DIR DiskName:, you will then be asked to insert the disks whose name you entered.

By now if you are like me you are getting to be a little frustrated with the whole procedure. You now have three options:-

- (1) Buy a second drive and then with your Workbench disk in the internal drive and your second disk in the external drive type DIR DF1:, the list appears!

- (2) continue with the same tedious process as mentioned above (There is one little shortcut, type DIR ?, this tells the Amiga to load the DIR command and display the options etc. of that command, now by being sneaky you can take the Workbench disk out of the drive and place the disk whose directory you are interested in into the drive and, the list appears! or

- (3) Create a RAM Disk !!!

After the C-64, the 512K supplied by the Amiga is awesome, so let's use some of it. Type:

MAKEDIR RAM:C

This creates (makes) a directory on the RAM: device (think of it as a 'free' disk drive). Then copy all the commands from the C directory on your Workbench disk to the C directory on the RAM: disk by COPY C RAM:C ALL. This takes a little time and you can see what is going on, to speed things up a little you could have added QUIET which tells the Amiga not to tell you which files it is copying. After this is done you then issue the command to the computer to tell it where to look for these commands. Type:

ASSIGN C: RAM:C

now type

DIR DF0:

the list appears!

The RAM: Disk is an integral part of the CLI user's life. While taking a little time to create before each session, the benefits you reap are worth this time. Because the commands are located in RAM: loading time is quickened as the commands are already in memory and

only have to be 'shifted' as opposed to loaded in.

This process may seem a little tedious but by incorporating these few commands into your startup-sequence they are performed automatically for you when you 'boot' your system (No!, not with your shoes. The term literally means 'startup'). Anyone can modify their startup-sequence file by using an ASCII file editor, one is supplied free with your Amiga, Ed, but you may prefer to use MicroEmacs, a very good public domain line editor, or even your favourite wordprocessor and save the file being edited in ASCII format. Simply place the above mentioned commands before the last line of your original startup-sequence, remove the last line and save your new file. You can test it by performing a CTRL-LAMIGA-RAMIGA restart. This time you will see that the CLI doesn't disappear but by resizing the window and moving it around you still have access to the Workbench (isn't multi-tasking wonderful!).

You will notice that you have a lot less memory left compared to when you first started. There are two ways to improve upon this problem:

- (1) buy more memory, plug it in and restart your Workbench disk, voila! plenty of memory or

- (2) the less financially demanding way is to 'customise' your startup-sequence so that it loads only the commands that you use frequently. (This will be discussed in a later article)

A must for the budding CLI user is a DOS manual, which does not unfortunately come with the machine and has to be purchased later. This is full of interesting and helpful information about Amiga DOS. Also keep an eye peeled for articles in magazines on the CLI, they usually contain useful tidbits of information that may help you.

I hope this short introduction gives you some basis for the beginnings of an enjoyable future with your Amiga and its Disk Operating System. ■

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News and views, hints and tips

from Tim Strachan

Preferences problem

PREFERENCES HAS a bit of a bug when it comes to changing settings, such as selecting a new printer driver. If you make a change to Preferences, and then click on SAVE, the changes will be saved to disk, but not currently active, which may explain why you've had problems from time to time. What you have to do, having saved your changes, is to open Preferences again and click on either LAST SAVED or USE and the saved Preferences settings are loaded into memory. (Likewise, incidentally when you're using a hard disk, you should copy the `devs:system-configuration` file to your boot-up disk for your saved preferences to be operative from your hard disk). ■

Boot-up signals and colours

(courtesy AA&J magazine)

ABOUT THE COLOURS when you do a cold boot - dark grey means the micro-processor is running fine; light grey that the ROMs passed a checksum test; white, that RAM is tested, not found wanting, and the system starts up.

All the above is what should normally happen. If a glitch occurs, you'll probably see - red for a ROM error; green for an error in chip RAM (NB: if the SCA virus is in memory and you hold down the left mouse button while rebooting, you'll see green); blue for an error in the custom chips; yellow for an error before the error-trapping routines (which land you with a Guru) are operating.

The keyboard also has a self-test routine, and if it fails, the CAPS LOCK light blinks: one blink - a check of keyboard ROM failed two blinks - keyboard ram is not good three blinks - the keyboard's internal timer isn't scanning the keyboard properly four blinks - short circuit in the keyboard. So, you can check these things and tell the serviceman if you ever have to use him. And if a line

of apostrophes forms at boot, your keyboard connections are awry. Incidentally, odd things have been happening to people's Amigas, screen going blank, machine going back to Kickstart prompt (A1000 problem usually indicating that the PAL chips - Programmable Logic Array chips - are being overloaded, and are of the inferior type), and other cute problems. Its worth using the two Virus checker/eliminator utilities on this disk to check ALL your bootable disks, because odd problems may well be due to an unwelcome inhabitant in your memory. ■

2000 Bugaboo

IT'S COMMON FOR the A2000 to chew up the first character that you type after you boot - so hit the key again and continue. (Other bugs and oddities solicited, so please send them in so we can explain them to others.) ■

Printers and printer drivers

PRINTERS AND THEIR drivers are currently a thorny problem on the Amiga. Quite a lot of people have rung me to find a printer driver for their particular printer, and only occasionally can I help them, especially when it comes to 24-pin dot matrix printers. However, a few glimmers of optimism are possible:

● Version 1.3 of the operating system software will deal with the printer problem much better than 1.2, in terms of speed and colour and number of printers addressed.

● *Shakespeare*, the newest Desktop Publishing program, has been released with some early release versions of the new printer drivers to come out with the 1.3 software. Amongst them are drivers for: QumeLetterPro20; Calcomp Color-master and version 2; Diablo Advantage D25; EpsonQ; Xerox 4020, HP Paint-

Jet.

● A plea, then - send in to Megadisc, PO Box 759, Crows Nest 2065, any information you have gained about your printer, printer drivers, using the settings in Preferences to print out, etc. Send on disk and we'll send you back whatever two PD disks you mention. It would be nice to collect all the current drivers together so they could be sent out to users in distress! We've already got quite a collection, but send them in, or enquire at Megadisc on (02) 9593692. ■

Directory utilities

THERE'S A DEEP and wide tradition of "directory utilities" for the Amiga, very useful programs of small size which allow access to many, if not all, of the features of both the Workbench and the CLI, with the use of the rolling rodent.

The tradition continues with recent offerings on the public domain, some of them very innovative in their approach to improving use of the computer. A selection:

Browser - Found on Club Amiga BBS, this opens a window with all the devices (drives, ram disks, etc) listed. Any of these can be double-clicked to list its contents, and so on through sub-directories. In the Workbench way, you can "drag" names of files as if they were icons and other similar techniques. You can perform most CLI operations with the the mouse, and add any number of programs/utilities to a list in the Tools menu. Very useful.

Menu-runner - On Amigan #15 (just arrived from *Amigan Apprentice* mag), this clever utility sets up a menu with a selection of about 40 configurable programs (up to you), as well as an output window for those programs that need to output information to the screen (such as list, free, etc). Once again use Workbench techniques to access the power of the CLI.

Utili-Master - A little more conventional, this one is however also configurable, and uses the usual window/button interface as do. Very fast and very stable.

Jobs2 - Again, you can configure this

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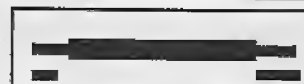
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one to call those programs you want, and the docs make a much better job of explaining how to use the thing. Anyone who used the original *Jobs* will want to have a look at this one.

Stop Press! Just got *Jobs 4* from a bbs, and it goes even further than the previous ones! Well, it is an update, but it is serious stuff, and easy to use, and probably the most configurable, and therefore powerful, of all these devices. In fact you can configure 291 of your own utilities to run from this one! Ask for it on an upcoming DIRUTILS theme disk. ■

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Beginners start here!

by Andrew Farrell

If this is your first time through the *Australian Commodore and Amiga Review*, or maybe you've just bought yourself a computer, here's a guide to all the jargon you'll run into - especially written for beginners.

Hardware vs software

It's an often used, but very true phrase, that if you can kick it, it's hardware. Everything from the computer itself, to the many appendages we can connect, is referred to as hardware. The nuts and bolts, silicon and plastic are the hardware.

A printer, disk drive, terminal, visual display unit or plug in games cartridge is hardware. Software refers to the instructions that a computer understands, and that are arranged in a special order referred to as a program.

Putting information into a computer is NOT programming it. Preparing a list of commands or special instructions for the computer to execute IS. Both programs and information reside safely in the computer's memory, and on floppy disks or other storage media.

The concept compares well with the home sound system. Imagine that the record player, cassette deck, or CD player are the hardware of your computer system. The cassettes, CD's and records are equivalent to the floppy disks, or cassettes used in a computer.

There is one fundamental difference. As you play a track off your favourite record, the music is picked up by the needle, and played through the amplifier. The music never actually leaves the record, and you need the record to play the music. Insert a disk into your computer, and you must LOAD or transfer the program into the computer's memory. A small head, similar to the head in a cassette player, reads the information from the disk.

The program remains on the disk it was on, but a copy now resides within the computer itself. The instructions contained within are then executed. You can see the results on your screen, or printer, but the program itself is really just a series of electrical impulses. Since the program is safely tucked away in the computer's memory, which is quite large, you can remove the disk. Some programs access the disk, retrieving small amounts of information each time, and updating data already stored.

For these, you must be very careful not to remove the disk until the program has finished.

RAM & ROM

Inside the computer, specialised silicon chips perform specific jobs. Each chip is encased in black plastic, with many small legs. Inside this largish rectangular shape is the silicon chip itself, which is only the size of your smallest finger nail. Computer programs, and information are stored in these chips. Two types are used in particular.

Random Access Memory

Random Access Memory is the computer's workspace. Information is stored and can be changed in RAM. RAM is divided into bytes, each of which can store roughly one character. A character could be any letter of the alphabet, or perhaps a number or special symbol.

Each byte or character (letters and numbers) is in turn broken down into BITS. Each BIT corresponds to a transistor inside a silicon chip. Transistors may be either off or on, just like a simple switch. By combining several transistors together, it's possible to produce different combinations of offs and ons.

With eight transistors there are 256 different combinations, or ways of arranging the ons and offs. An eight BIT computer has eight BITS in each BYTE. Larger computers use sixteen or even thirty BITS in each BYTE.

One thousand and twenty four bytes make a KILOBYTE, or K for short. A typical IBM compatible computer would have 512 Kilobytes of RAM, or workspace.

Deep inside, computers work using a number system called BINARY. In the early days, to program and use a computer you needed to know how to use BINARY. Today, only application programmers and the people who design the system software or operating system of a computer need ever deal with this counting system.

Read Only Memory

Like RAM in all respects except that it can't be erased, or written to, ROM is a permanent means of storing information. Programs required by the computer to do simple tasks are often stored in ROM. For example, to print a character on the screen, a special routine or small program might be stored permanently in the computer's ROM. Any other program needing to print a character on the screen could then make use of that routine.

Many thousands of routines go to make up the computer's OPERATING SYSTEM or built in languages.

Peripherals

Most computers enable you to add a variety of additional devices for storing information, printing it out, or performing special tasks. These devices are called peripherals. They combine to make a computer into a system, much the same as the various attachments to a food processor. Although the food processor works on its own, the additional plug in items enhance its operation, just like the computer and its peripherals.

A few commonly used peripherals and hardware add-ons include:-

Disk drive, mouse, expansion RAM, printer, paddle, digitiser, modem, joystick, SCSI interface, tape backup, lightpen, drive controller, scanner, touch pad, EGA card, monitor, track ball, parallel interface.

Disk drives

A disk drive is like a combination of your record player, and cassette deck. Information is stored magnetically, like a cassette. However it is stored on a disk, like a record. The disk is divided up into tracks. Each track forms a complete circle, unlike those on a record which spiral toward the centre. Tracks are then divided into parts called sectors.

A blank disk must first be formatted before use. During this operation, the tracks and sectors are labelled, and a directory is stored on the disk telling the com-

puter where there is space to store information.

The way in which different Operating Systems label each track and sector varies. For this reason, it's not always possible to take information stored on a disk by a certain computer, and read it from a different machine.

This problem is often described as the "compatibility" of a machine. If a computer can read and execute programs stored on IBM PC type formatted disks, it is known as an IBM compatible computer. Commodore PCs are IBM compatible.

Fortunately, there are other ways of moving information between "incompatible" formats. Software written to work with one particular microprocessor will not work on a computer with an incompatible microprocessor. For example programs for the Commodore Amiga will not work on an Commodore PC.

Files

Information stored on a disk is grouped into files. Each file has a name, length, and type. A file might contain text relating to a wordprocessing document. Files may also be programs, a database, lists or special numbers.

By arranging information in this way, the disk operating system knows how all the information on the disk relates. Without the file arrangement, each sector on the disk would be meaningless.

Whenever a file is stored on a disk, its name is recorded in the disk directory. This is just a list of the disk's contents, including where about files can be found, how long they are and what type of file it is that is stored.

If you need to know what is on the disk, it is normally possible to take a look at the disk directory. Files may be deleted



or erased. When this happens, the directory entry about that file is removed, space for other information.

Until the disk is written to, the information relating to that file is still scattered around the disk.

You may also copy files from one disk to another, on the same disk or even entire disks at a time.

The process of getting a file into the computer is referred to as LOADING or reading that particular file. In some instances you only use part of a file at a time. For example, if you had a database or list of phone numbers, along with the subscriber's address and personal interests, the resulting file would be very large.

If you wanted information about one particular person, it would be wasteful to have to LOAD the entire file into memory. Instead, a special pointer is used to jump into the file to the right spot where the required details are stored. Only that part of the file is then read, and may be changed and updated. This is called RANDOM ACCESS.

Modems

A modem is used to send information between computers, via telephone. Data is changed into audible beeps and tones, which is then decoded by the receiving computer. This process is known as MODulation/DEMODulation - thus the term MODEM. Communications between computers is an exciting field. It makes possible some very powerful facilities. Automatic Teller Machines are linked together using modems.

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30 characters per second.

Others

Dozens of other devices are available to perform special tasks. These include printer/plotters, datasettes, digitisers, and scanners.

Operating systems and languages

For a computer to perform even the simplest of tasks, it needs software. When you switch on, a special program built into a ROM in the computer, comes to life. It checks how much memory is available, what peripherals are connected, and displays a power up message.

This program is part of the computer's operating system, or group of programs that let you use the computer. Examples of operating systems are MS-DOS, Unix, CP/M, and Amiga DOS.

The word DOS stands for Disk Operating System. This denotes that the operating system is disk based. In other words, you need a special disk, and disk drive to make it work.

Different operating systems require different commands to perform a job. On some small computers, the operating system is part of the built in programming language.

A Commodore 64 has the BASIC (Beginners All-purpose Symbolic Instruction Code) programming language, and operating system stored entirely in the computer's 16K ROM. No disk or disk drive is needed. Information can be stored on cassette.

An MS-DOS machine, such as the Commodore PC20, has a small part of the operating system built into ROM, some which is LOAded into RAM when the computer is powered up and the rest is only LOAded from disk as needed.

On the Commodore Amiga the operating system is capable of doing several jobs at once. It also has a variety of

modes of operation. Using the Workbench, commands are issued by way of a pointer called the MOUSE. Pictures and menus on the screen provide the various options available.

From the CLI, or Command Line Interpreter, commands are issued in the same way as MS-DOS. Normally it is the operating system that decides whether software from one computer is compatible to any extent with software from another.

It's not necessary to know how to program a computer to be able to use one to the full. However, if you plan writing your own custom applications, learning to program is an essential step.

A program language is structured much the same as the different languages we speak. Each has its own set of words, or commands and statements, with special rules of grammar, or ways as to how they can be combined.

Most home computers provide BASIC for you to write programs in. This language is fairly easy to get started in, and is suitable for many different uses.

More serious users writing business programs will use DBASE III on an IBM compatible computer, using the MS-DOS 3.2 operating system. DBASE III is designed for storing information in much the same way as a filing cabinet. It has a special language to program functions such as adding up the total of all invoices outstanding, or automatically deleting inactive clients on a mailing list.

Around the keyboard and screen

The computer's keyboard and screen, are an important part of any computer system. Using the keyboard, the user can write programs, enter information, and send commands to peripherals. Additional devices are also used to control the computer, such as a Mouse, Light-Pen, or Touch Screen.

Every key press is sent to a small

buffer or temporary storage area. From here it is fetched as soon as the program running is ready to use it. Sometimes it's possible to type ahead of the computer. Because of this buffer, your keystrokes aren't forgotten.

The keyboard itself is much the same as a standard typewriter. It is called a QWERTY keyboard, due to the arrangement of the first five characters on the top row of alphabet keys. The keyboard we use today was actually designed to slow down our typing speed. When typewriters were first invented, typists found that they could type faster than the mechanics of the type writer were able to cope. So the keyboard was changed to slow them down.

Today, we use the same layout, despite far better arrangements being available, such as the DVORAK keyboard.

Instead of a carriage return lever, the computer keyboard has a return key, just like an electric typewriter. There's also function keys, to perform special jobs. Other keys provide the ability to stop, or pause programs, or quit out of what you're doing.

A small flashing square on the screen shows where the next character you type will appear. This is called the cursor.

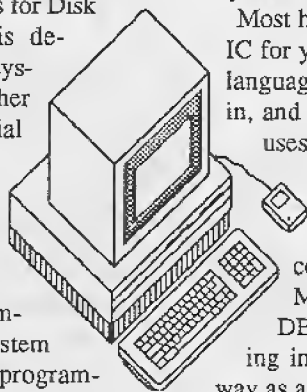
The screen is divided into rows and columns. On an IBM compatible there are normally 80 columns and 25 rows of characters. Smaller home computers have only 40 columns.

Sometimes the screen display will scroll, either up or down to allow a new line of text to be displayed. Each time the display scrolls, an entire row of characters moves off the screen.

Computers are also able to display graphics, by dividing the screen into individual dots instead of characters. Each of these dots is called a PIXEL or Picture ELEMENT.

Graphics

Today's home computers produce stereo music, with stunning cartoon quality animation and pictures. These pictures are often referred to as computer graph-



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ics.

How are they made?

The computer screen can be divided into small dots. These are called PIXELS, or Picture Elements. Each of these dots corresponds to a BIT inside the computer's memory. By switching BITs off and on, animation is achieved.

The number of PIXELS displayable on the screen is called the resolution. Sometimes several resolutions are available, normally expressed as the number of dots horizontally by the number of dots vertically. A Commodore 64 has a 320 x 200 pixel graphics display, using two colours in every 8 x 8 square.

This mode is called hi-res mode, or high resolution graphics. In another mode, greater colour availability is possible by halving the horizontal resolution to 160 pixels.

Horizontal measurements are often referred to as x and vertical measurements as y. Therefore a computer with a x resolution of 600 dots, allows 600 pixels horizontally across the screen.

Using a special graphics chip, small shapes may be defined using sprites or MOBS (Movable Objects). These might only be about 24 x 21 pixels in size, however they vary from one computer to another. They move independently of the main picture. Furthermore, collision detection between different sprites is possible. Many games use these facilities. Sprites are one of the most powerful features available to the games designer. Most arcade quality computers allow at least eight, if not sixteen different sprites on the screen at one time.

A basic colour computer can generate around 16 colours. More powerful version also allow a variation in the hue or intensity of each colour. The Amiga range facilitate up to 4096 colour. In most of the available colour resolutions not all of these colours can be used at once. So the 4096 colours are referred to as the palette.

With such powerful graphics facilities, it is no wonder that computers like

the Amiga are finding their way into the advertising world. Large companies also use the Amiga for presentations about products, or for training staff.

The cost of producing computer animation with music is far cheaper than video.

Pictures may be recorded by computers digitally. Using a video camera, the image is turned into a series of dots that are either off or on - corresponding to the computer's ability to store information. The resulting picture looks very similar to newspaper quality photographs.

Music

Computers can synthesize music in much the same way as an organ or synthesizer. Sound is formed by vibration. This action can be simulated in the computer, along with the timbre and pitch of each note. More powerful machines have several voices enabling them to play a number of different notes simultaneously.

Music can also be recorded into the computer's memory digitally, just like a Compact Disc. The result sounds very much like normal music played from a record or cassette. The quality of digitised music depends on the amount of memory used to store the sample. The more memory used, the better the quality.

It's also possible to connect an external keyboard to the computer using a MIDI interface. Information sent from the keyboard as music is

played is then able to be recorded using the computer. Later on, the music can be replayed and a new track recorded over the top of the first. Professional musicians make strong use of these facilities.

Computers cannot write the music for you, but they can sure make writing music far less laborious. A single musician has at his disposal many powerful facilities normally only possible in expensive recording studios.

Software is available enabling bud-

ding musicians to cut and paste notes onto a staff. The result can be played on the computer or printed out into sheet music.

Getting ink to paper

Most popular is the dot-matrix printer. Characters, or letters and numbers are formed by a series of dots placed close together. The result can vary from barely readable to virtually perfect letters.



Most users will be familiar with the quality produced by a daisy-wheel printer. Not unlike your average typewriter, this device produces each letter by stamping the required character against a carbon ribbon. An imprint is then made on the page that is well formed. Daisy-wheels, or golf-balls, may be interchanged to provide a variety of typefaces.

In practice this method produces what is referred to as letter-quality type writing. Some dot-matrix printers are able to come close to this quality by overlapping the dots, and doing a double pass over each letter. The resulting characters are called near-letter quality.

Various other forms of printing have come and gone over past years. These include thermal printing which burnt the letters onto special paper. The cost of paper was far too expensive, and it tended to deteriorate with age.

Ink-Jet printers are another alternative. These are very quiet, very fast but rather expensive. Ink is literally propelled onto the page, and each dot goes to form a letter in much the same way as a dot-matrix printer.

The latest development is the Laser Printer. These are based on the design of a photocopier. They work by etching the design of each character or dot onto a drum which then prints the entire page in one fell swoop. Quality is excellent, especially with use of a page description language such as Post Script. This language enables each character to be per-



fectly drawn by the laser.

The result is close to typesetting quality. Thus many publishing houses use laser printing to save typesetting costs and speed up production time. This very publication was produced using a Lazer printer.

Which printer do you need? For home use, a dot-matrix printer is the most flexible and least expensive choice. Because of the way in which each character is formed, a similar process may be used for creating graphics output.

Daisy wheel printer are confined to the available typefaces. However, the quality of output is higher. Thus, they're more suited to the business environment.

The process of printing graphics is often referred to as a high-resolution screen dump. In this operation each dot displayed on the screen in a bit-mapped display is printed on the printer correspondingly.

More expensive dot-matrix printers work faster. The speed is normally expressed as Characters Per Second or CPS. Around 80 CPS is average, with many

brands now arriving with 120 CPS standard. In low-quality draft mode a few will even reach as high as 300 CPS.



Daisy Wheel printers are inherently slow, due to the larger number of moving parts. They vary from 30 CPS to 90 CPS on ultra-expensive models.

Several printers available will handle colour. Since many computers are colour capable, this may seem a logical choice. However, in practice colour printing tends to have little day to day use. It is possible to print onto special plastic suitable for overhead transparencies.

Colour business reports also attract some buyers. For the hobbyist, a few smaller models will produce excellent reproductions of screen picture.

Using a printer

Most printers are equipped with a few simple buttons and levers which work in much the same way on all models. On the front panel, there are normally at least three buttons. These are Line Feed,

Form Feed and ON-Line.

To print information, the printer must be ready to listen to the computer. We tell it to listen by pressing the On-Line button. A small green light will switch on, indicating that all is well. A red light means a problem.

Most likely there is no paper, or it is badly positioned.

Line Feed moves the paper up one print line. This is useful for careful positioning, or ejecting printed pages. Form Feed moves the paper one entire form or page. Normally this is used to advance to the top of the next form to start a fresh print job, or to eject the most recently completed page.

On the left hand side of the carriage is a lever to switch between tractor and friction feed. Tractor feed is where the paper is fed by sprockets that grip holes along the side of each page. Friction feed is the same as a common typewriter, where the paper is held in position by pressure on the roller.

Tractor feed is normally used for continuous stationary. Friction feed is best for individual pages. ■

Perma-Colour

This program sets the border and the screen colour permanently. You may change the colours with the following pokes:

POKE 49165, X - BORDER COLOUR
POKE 49170, X - SCREEN COLOUR

.,	C000	78	SEI
.,	C001	A2 17	LDX ##17
.,	C003	A0 C0	LDY ##C0
.,	C005	BE 02 03	STX \$0302
.,	C008	BC 03 03	STY \$0303
.,	C00B	18	CLC
.,	C00C	A9 00	LDA ##00
.,	C00E	8D 20 D0	STA \$D020
.,	C011	A9 00	LDA ##00
.,	C013	8D 21 D0	STA \$D021
.,	C016	60	RTS
.,	C017	20 0C C0	JSR \$C00C
.,	C01A	4C B3 A4	JMP \$A4B3
.,	C01D	00	BRK

```

5 REM **** SHADOW OF RATT ****
10 FORA=49152TO49183
20 READB:C=C+B
30 POKEA,B
40 NEXT
50 IF C>2778 THEN PRINT "ERROR IN DATA":STOP
60 PRINT "(DOWN) DATA TRANSFER COMPLETE"
70 PRINT "(DOWN) SAVING BASIC LOADER 'COL-BAS'"
80 SAVE "COL-BAS",B
90 PRINT "(DOWN) SAVING M/C ROUTINE 'COL-49152'"
100 POKE43,000:POKE44,192
110 POKE53,000:POKE54,192
120 POKE45,029:POKE46,192
130 POKE55,029:POKE56,192
140 PRINT "(DOWN) RESETING COMPUTER....TYPE 'SYS49152'"
150 SYS64738
200 DATA120,162,023,160,192,142,002,003
210 DATA140,003,003,024,169,000,141,032
220 DATA208,169,000,141,033,208,096,032
230 DATA012,192,076,131,164,000,000,000
    
```

The colours remain unchanged after pressing run/stop restore or poking the normal locations (53280 and 53281)

The loading of the m/c file is the same as in the default address program, just type 'SYS49152' to execute instead of SYS32768... ■

Morpheus

From the creator of *Paradroid*, one of my all time favourites, comes his latest creation. Adam Rigby rockets down to Earth to tell us all how it rates.

IN THE WORDS of the author, Andrew Braybrook, "*Morpheus* was designed as a more advanced type of arcade game, without the constrictions of an actual coin-op which basically has the function of getting your money, giving you just enough enjoyment to get you interested, and then getting rid of you so that it can obtain some more money. *Morpheus* is more of a long term game. A game that you can return to more often. It was never intended to be a simple, fast action game."

Braybrook is definitely on to a good idea, with the emphasis being placed on the interest-holding ability of the game. When I first perused the instructions, the game presented itself along the lines of *Elite*, however more arcade-like and only in two dimensions.

The game was born with an ambition to produce a game system that could allow the building of huge spaceships that

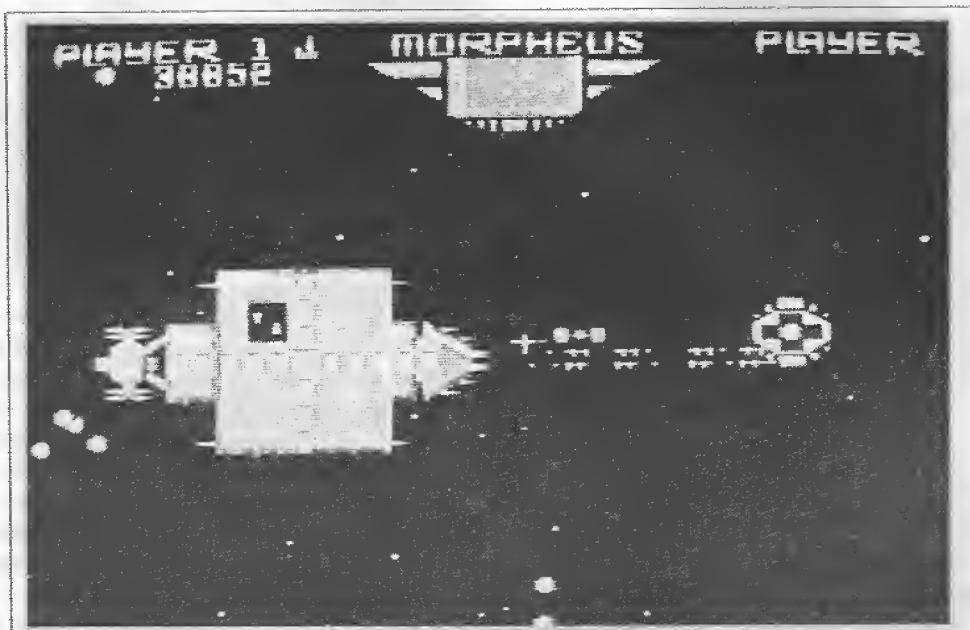
were functional, with plenty of options open to the player on how to design their ship. As you can see the concept itself is very similar to *Elite*. This tied in with another intention, to generate creatures that would behave as if they were alive, following behaviour patterns rather than strictly choreographed dance steps.

These pseudo-intelligent creatures, which Braybrook named Morphai, attempt to behave intelligently, they have no wish to be killed, and are not suicidal maniacs. They begin in a slightly sleepy state

and so are a little clumsy at first, but they quickly become agile, worthy opponents. They all show different personalities, some will attempt to escape, some will show curiosity, some will more blatantly attack.

They also react to their surroundings, they can be wounded by hitting the ship or by a close shot, and will behave quite differently depending on how hurt they are. They also learn, and so even if you encounter a Morphai at one stage and it reacts in a particular way it may act completely different if it escapes you and you run into it once again. Some even try to impersonate other elements in the game so as to escape detection.

The scenario



You start the game with the basic model of space ship, the HL1, this being the smallest of hulls and having no ability to hold extra weapons on board and only one extra system.

A system includes such things as en-

parts you have ordered.

You are awarded points and G's for the Morphia and the Orbitals that you destroy. The points awarded for killing a Morphai vary in respect to their advancement and behavior. If you killed a low

The concept of the game is definitely a good one, but as to the execution of the idea, I think that Andrew Braybrook has written much more playable games. The main problem I found with this game was that it was too middle of the road. When I say this I don't mean in quality but in overall style of gameplay. *Elite* is the perfect example of what Braybrook was trying to achieve but being more graphically orientated - being able to see the changes in your ship as well as use them. Certainly the idea of a simpler version of *Elite* was a good one but I don't feel that it went in the right direction far enough.

As an arcade game it sorely

energy converters (these are essential because when the ship run out it explodes) shields, electronic counter systems and various types of indicators. The number of systems that you can carry depends on the type on ship you have, the least being one and the most being seven on the Deluxe ship which costs a mammoth 150,000 G.

Perhaps now would be a good time to enter into the various details surrounding building a space ship to your preferences. First it takes money. Which you probably don't have. However, if you have been a good little mercenary then the federation will have rewarded you well and you can proceed with ordering new weapons and systems. All hardware takes time to be built once contracted, so you will have to go and do some more fighting and hope that you can do without the

level, passive Morphai you could expect 10 points or G but if the Morphai was very aggressive and of technical advancement then you could receive anything up to 500 points.

For an Orbital you are awarded 500 points. Once the Aither has collapsed then you can return to the nucleus and destroy the bonus Morphai for 2000 points each. There is only one of these per level that you are on.

Overall

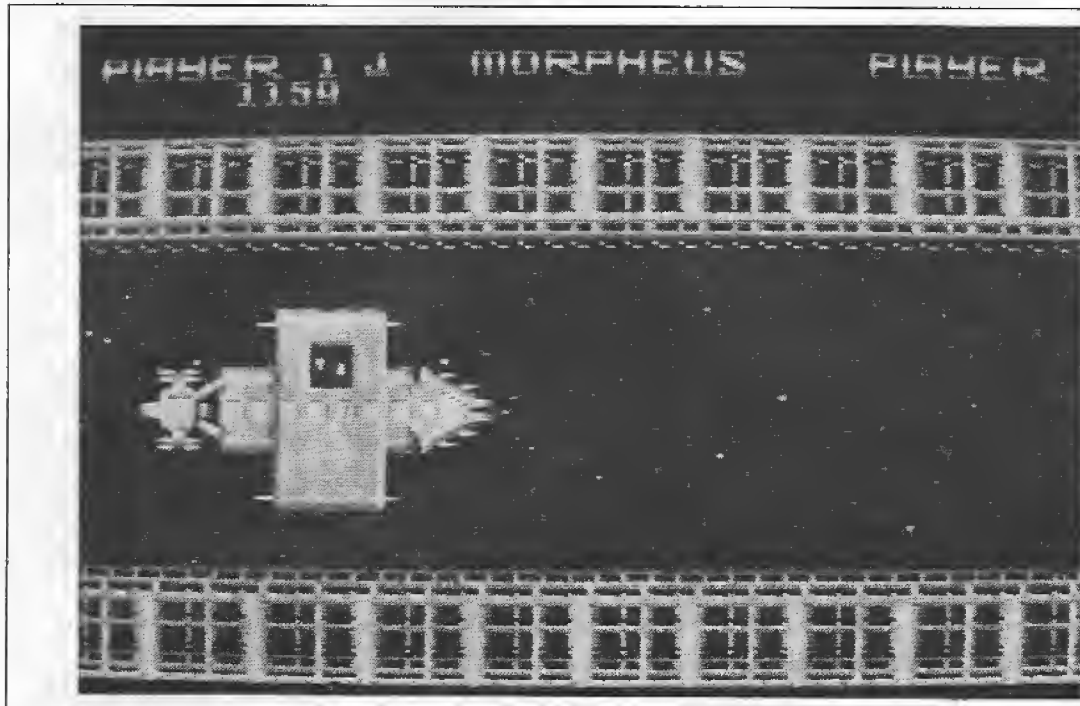
Firstly I must say that the graphics in the game are of a very high standard, comparable to those in Braybrook's others game such as *Paradroid*. The music and sound are also very impressive - some of the routines are obviously out of his other games.

lacks in some areas - for some unknown reason the ship cannot turn around and is very slow, firing is extremely awkward and gameplay is far from being exciting.

This may sound like an extremely negative review and in some ways it is, but the concept is such a good one that I was quite disappointed the game didn't fulfill my expectations. I am really judging the game by comparison with the idea in my mind, rather than by comparison with other packages on the market - against which it does rate reasonably well.

This game will appeal to many people. It is definitely worth a look at, but the sad thing is that it didn't develop to its potential.

Morpheus is distributed by Imaginering (02) 697 8666. ■



POKEs for almost everything

To use any of the following POKEs first load the game and then reset the 64. If you have a Commodore 128, use the reset switch at the side (but don't forget to keep your finger on the Commodore key during the operation)- 64 owners can either use a reset switch, or a cartridge with a reset switch.

Enter each POKE separately, following each entry with a RETURN. If there's a colon between each type in the whole

line and then press return. Once you've entered the POKEs, re-start the game by typing SYS and the number, and then press return.

Some of you seasoned readers may think that these detailed instructions are a little patronising, but some of the newer Commodore owners have tremendous problems utilising POKEs - so bear with them.

1942 (*Elite*) POKE 5806,234:POKE 5807,234 SYS 2640
Unlimited lives
1985 (*Mastertronic*) POKE24036,0SYS 20000 *Unlimited lives*
Action Biker (*Mastertronic*)POKE 19287,47 SYS 13312 *Unlimited lives*
Ancipital (*Liamasoft*) POKE 18679,173 SYS 16384 *Unlimited lives*
Arc Of Yesod (*Odin*) POKE 33969,234 POKE 33970,234 SYS 2053 *Unlimited lives*
Arcana (*New Generation*) POKE 12933,0 POKE 12934,2 SYS 4096 *Unlimited lives*
Attack of the Mutant Camels (*Liamasoft*) POKE 11639,255 SYS 4096 255 *lives*
Auf Wiedersehen Monty (*Gremlin Graphics*) POKE 21862,76 POKE 21863,123 POKE 21864,85 SYS 16384 *Unlimited lives*
Back to Reality (*Mastertronic*) POKE 20109,173:SYS 16384 *Unlimited lives*
Batalyx (*Liamasoft*) POKE 19567,234 POKE 19568,234 POKE 19569,234 SYS 16384 *Unlimited lives*
Big Mac (*Mastertronic*) POKE 4170,250 SYS 19072 *Unlimited lives*
Black Hawk (*Creative Sparks*) POKE 8290,255 SYS 8192 255 *lives*
Blue Max (*US Gold*) POKE 17925,173 POKE 25584,173 POKE 17438,0 SYS 32768 *Unlimited lives*
BMX Racers (*Mastertronic*) POKE 11617,138 POKE 11618,2 SYS 11770 *Unlimited lives*
BMX Simulator (*Code Masters*) POKE 13937,0 SYS 4096 *Unlimited lives*
Bombjack (*Elite*) POKE 5112,0 SYS3101 *Unlimited lives*
Bombjack II (*Elite*) POKE 7053,200 SYS 39712 *Unlimited lives*
Breakthru (*US Gold*) POKE 5647,3 SYS 2560 *Unlimited lives*
Brian Bloodaxe (*The Edge*) POKE38270,165 POKE 39079,165 SYS 39145 *Unlimited lives*
Buck Rogers (*US Gold*) POKE 33182,250 SYS 32782 *Unlimited lives*
Bug Blaster (*Allgata*) POKE 18760,234 SYS 18360 *Unlimited lives*
Camelot Warriors (*Arloiasoft*) POKE 23730,234

POKE 23731,234 POKE 23732,234 SYS 16384 *Unlimited lives*
Cavelon (Ocean) POKE 25728,96 SYS 11480
Caverns of Eriban (*Firebird*) POKE 48291,221:POKE 48292,248 SYS 50333 *Unlimited lives*
Caverns of Sillahc (*Interceptor*) POKE 16805,169:POKE 16806,0:POKE 16807,234 SYS 5000 *Unlimited lives*
Challenge of the Gobots (*Reaktor*) POKE 28798,80:SYS 16384 *Unlimited lives*
China Miner (*Interceptor*) POKE 32776,0 SYS 33127 *Unlimited lives*
Chiller (*Mastertronic*) POKE 22957,173 SYS 50758 *Unlimited lives*
Chuckie Egg I (A 'n' F) POKE 16851,255 SYS 14848 255 *lives*
Chuckie Egg II (A 'n' F) POKE 24577,1:SYS 18698 *Unlimited lives*
Comic Bakery (*Imagine*) POKE 59582,173 SYS 2304 *Unlimited lives*
Commando (*Elite*) POKE 14631,0 SYS 2128 *Unlimited lives*
Crazy Comets (*Ricochet*) POKE 37002,169 POKE 37003,0 POKE 37004,234 SYS 24881 225 *lives*
Curse of Sherwood (*Mastertronic*) POKE 6404,0 SYS 17423 *Unlimited lives*
Cybertron (*Anirog*) POKE 6888,234 POKE 6889,234 POKE 6890,234 POKE 6891,234 SYS 2128 *Unlimited lives*
Cylu (*Firebird*) POKE 39409,173 SYS 49152 *Unlimited lives*
Dare Devil Dennis II (*Viper*) POKE 24683,138 POKE 24683,138 SYS 39700 *Unlimited lives*
Deliverance (*The Power House*) POKE 56356,234 POKE 54657,234 POKE 53658,234 SYS 7360 *Unlimited lives*
Denarius (*Firebird*) POKE 38218,234 POKE 38219,234 POKE 38220,234 SYS 6912 *Unlimited lives*
Dropzone (*US Gold*) POKE 1007,55:POKE 1011,132:POKE 1012,255 SYS 1006 *Unlimited lives*
Druid (*Firebird*) POKE 39271,255 SYS 5120 255 *lives*
Electrix (*Americana*) POKE 22667,234:POKE 8192,60 SYS 24576 *Unlimited lives*
Elevator Action (*Quicksilva*) FOR 1=50911 TO

50915:POKE 1,234:NEXT SYS 53200 *Unlimited lives*
 Elidon (*Orpheus*) POKE 2811,173 SYS 2304 *Unlimited lives*
 Enforcer (*The Power House*) POKE 12227,228 POKE 12228,49 SYS 52432 *Unlimited lives*
 Equalizer (*The Power House*) POKE 26098,234:POKE 26099,234 SYS 24912 *Unlimited lives*
 Exolon (*Hewson*) POKE 7427,205 SYS 2061 *Unlimited lives*
 Fairlight (*The Edge*) POKE 34413,234 POKE 34414,234 POKE 34420,234 POKE 34421,234 SYS 20992 *Unlimited lives*
 Falcon Patrol (*Virgin*) POKE 16705,250 SYS 16640 *Unlimited lives*
 Falcon Patrol II (*Virgin*) POKE 28768,234:POKE 28769,234 SYS 28672 *Unlimited lives*
 Feud (*Bulldog*) POKE 16404,15 SYS 16384 *Start with all ingredients*
 Finders Keepers (*Mastertronic*) POKE 29787,76 POKE 29788,96 POKE 29789,116 SYS 49152 *Unlimited lives*
 Firetrack (*Electric Dreams*) POKE 12285,234:POKE 12286,234:POKE 12287,234 SYS 9216 *Unlimited lives*
 Flak (*US Gold*) POKE 9524,255:POKE9525,255 SYS 3072 *255 lives*
 Force One (*Firebird*) POKE 2203,255 SYS 2063 *255 lives*
 Freak Factory (*Firebird*) POKE 25671,173:POKE 25685,173:POKE 40275,173 SYS 16384 *Unlimited lives*
 Frost Byte (*Mikro-Gen*) POKE 4388, 165 SYS 2825 *Unlimited lives*
 Game Over (*Imagine*) POKE 15244,234 POKE15245,234 SYS 2304 *Unlimited lives*
 Ghostbusters (*Activision*) POKE 38454,96 SYS 24576 *Unlimited lives*
 Ghosts 'N' Goblins (*Elite*) POKE 2175,255 SYS 2128 *255 lives*
 Gilligan's Gold (*Ocean*) POKE 17993,0 SYS 25532 *Unlimited lives*
 Gyroscope (*Melbourne House*) POKE 46687, 76 POKE 46688, 105 POKE 46689, 182 SYS 2067 *Unlimited lives*
 Haunted House (*Alligata*) POKE 7609,234 SYS 9500 *Unlimited lives*
 Head Over Heels (*Ocean*) POKE 30315,144 POKE 30316,144 SYS 324 90 Heads and Heels, and 90 doughnuts
 He-Man (*US Gold*) POKE 6513,173 SYS 18550 *Unlimited lives*
 Henry's House (*English Software*) POKE 4063,173 SYS 2560 *Unlimited lives*
 Hercules (*The Power House*) POKE 3905, 169:POKE 3906,0:POKE 3907,234 SYS 2304 *Unlimited lives*
 High Noon (*Ocean*) POKE 18033,255 SYS 16384 *255 lives*
 Hover Bovver (*Liamasoft*) POKE 32133,65 SYS 32768 *Unlimited lives*
 Hunchback (*Ocean*) POKE 22521,234 POKE22522,234 POKE 22523,234 SYS 16384 *Unlimited lives*
 Hunter Patrol (*Mastertronic*) POKE 9307,234:POKE 9308,234 SYS 12080 *Unlimited lives*
 Hypercircuit (*Alligata*) POKE 31352,250 SYS 26624 *Unlimited lives*
 I,Ball (*Firebird*) POKE 20669,234 POKE 20670,234 SYS 16939 *Unlimited lives*
 ICUPS (*Firebird*) POKE 3265,234 POKE 23676,234 SYS 2064:SYS 33280 *Unlimited lives*
 Imhotep (*Ultimate*) POKE 38054,201 SYS 36443 *Unlimited lives*
 Iridis Alpha (*Hewson/Liamasoft*) POKE 16411, 128 SYS 16384 *128 lives*
 Jail Break (*Konami*) POKE 52050,173:POKE 52097, 173 SYS 51200 *Unlimited lives*
 Jeep Command (*Bug Byte*) POKE 32627,241 SYS 16384 *Unlimited lives*
 Killer Watt (*Alligata*) POKE 40305,234 SYS 33792 *Unlimited lives*
 Kong (*Anirog*) POKE 12176,255 SYS 12128 *255 lives*
 Krakout (*Gremlin Graphics*) POKE 33802,234 POKE 33803,234 SYS 15312 *Unlimited lives*
 Kung-Fu Master (*US Gold*) POKE 34142, 128 SYS 32768 *Unlimited lives*
 The Last V8 (*Mad*) POKE 7149,173 POKE 7326,173 POKE 7858, 173 SYS 3328 *Unlimited lives*
 Lazy Jones (*Terminal Software*) POKE 4063,173 SYS 2061 *Unlimited lives*
 Light Force (*FTL*) POKE 11547,5 SYS 6713 *Unlimited lives*
 Living Daylights (*Domark*) POKE 4390,238 SYS 4352 *Unlimited lives*
 Manic Miner (*Software Projects*) POKE 16573,234:POKE 16572,234:POKE 16571,234 SYS 16384 *Unlimited lives*
 Mermaid Madness (*Firebird*) POKE 17274,169 POKE 17275,0 POKE 17276,234 SYS 16384 *Unlimited lives*
 Metrocross (*US Gold*) POKE 13501,234 POKE 13502,234 SYS 4096 *Unlimited time*
 Moonbuggy (*Anirog*) POKE 22535,169:POKE 22536,0:POKE 22537,234 SYS 5120 *Unlimited lives*
 Motor Mania (*Audiogenic*) POKE 8646,255 SYS 8000 *255 lives*
 Mutant Monty (*Artic*) POKE 21647,173 SYS 22039 *Unlimited lives*
 Mutants (*Ocean*) POKE 9273,230 SYS 4096 *Unlimited lives*
 Nemesis (*Konami*) POKE 5868,255 SYS 5768 *255 lives*
 Oink (*CRL*) POKE 39922,165:SYS 16384 *Unlimited*

Rubbishmen

Olli and Lissa (*Firebird*) POKE 8844, 165 SYS 7427
Unlimited Power

Orpheus in the Underworld (*The Power House*)
POKE 18870,234:POKE 18871,234:SYS 9728 Unlimited
lives

Pac Man (*US Gold*) POKE 5737,254 SYS 2064
Unlimited lives

Panther (*MAD*) POKE 14127,169 SYS 4096 Unlimited
lives

Parallax (*Ocean*) POKE 5796,96 SYS 319 SYS 319
Unlimited lives

Park Patrol (*Firebird*) POKE 26700, 191 SYS 2076
Unlimited lives

POD (*Mastertronic*) POKE 26364, 173 SYS 26112
Unlimited lives

Poster Paster (*Task Set*) POKE 17826,255 SYS 37874
255 Lives

Quintic Warrior (*Quicksilver*) POKE 8547,173 SYS
8233 Unlimited lives

Quo Vadis (*The Edge*) POKE 24709,234:POKE
24710,234 SYS 3488 Unlimited lives

Red Max (*Code Masters*) POKE 6352,173 SYS 2064
Unlimited lives

Repton III (*Superior*) POKE 16953,234 POKE
16954,234 POKE 16955,234 SYS 16384 Unlimited lives
Robin of the Wood (*Odin*) POKE 36391,255 SYS
16384 255 Lives

Rocket Roger (*Alligata*) FOR A 255 lives 7680 TO
7720:POKE A,255:NEXT SYS 5600 255 lives

Saboteur (*Durell*) POKE 56325,255 SYS 30735 255 lives
Scooby Doo (*Elite*) POKE 7450,96 SYS 2560 Unlimited
lives

The Sentinel (*Firebird*) POKE 6664,96 SYS 16128
Sentinel can't drain energy

Shadowfire (*Beyond*) POKE 25188, 173 SYS 16384
Stops timer

Skyjet (*Mastertronic*) POKE 27792,250 SYS 29350
Unlimited lives

Slamball (*US Gold*) POKE 3245,250 SYS 2066
Unlimited lives

Sorcery (*Virgin*) POKE 56325,255 SYS 31744 Slows
timer

Space Harrier (*Elite*) POKE 6010,173 SYS 2128
Unlimited lives

Split Personalities (*Domark*) POKE 7033,234 POKE
7034,234 POKE 7035,234 POKE 2050,234:SYS 13165
Unlimited lives

Spooks (*Mastertronic*) POKE 14919,32 SYS 5616
Unlimited lives

Spy Hunter (*US Gold*) POKE 35914,255 SYS 32782
255 lives

Staff of Karnath (*Ultimate*) POKE 5634,45 SYS 2560
Unlimited lives

Starquake (*Bubble Bus*) POKE 3661,169 SYS 3075
Unlimited lives

Stealth (*US Gold*) POKE 30590, 173 SYS 53055
Unlimited lives

Strangeloop (*Virgin*) POKE 45486,173 POKE 44217,
173 SYS 865 Unlimited lives

Street Surfer (*Entertainment USA*) POKE
3868,230:POKE 3869,67:POKE 3870, 169 SYS 3072
Unlimited lives

Superman (*Beyond*) POKE 37940, 0 POKE 22605,0 SYS
4096 Unlimited lives

Taskmaster (*Creative Sparks*) POKE 29577,234 POKE
29578,234 POKE 29579,234 SYS 27328 Unlimited lives

Terminator (*The Power House*) POKE 8323,255 SYS
6704 Unlimited lives

Terra Cognita (*Code Masters*) POKE 26703,255 SYS
24576 Unlimited lives

Thrust (*Firebird*) POKE 6139,234 POKE 6140,234
POKE 6141,234 SYS 2304 Unlimited lives

Trailblazer (*Gremlin Graphics*) POKE 29738,234
POKE 29739,234 SYS 25729 Unlimited lives

Trapdoor (*Piranha*) POKE 14914,96 SYS 14336
Unlimited lives

Underwulde (*Firebird*) POKE 34404,45 SYS 36209
Unlimited lives

Up 'N' Down (*US Gold*) POKE 36103,173 SYS 32768
Unlimited lives

Video Meanies (*Mastertronic*) POKE 18535,234 POKE
18536 SYS 19723 Unlimited lives

Warhawk (*Firebird*) POKE 27090,234 POKE 27091,234
POKE 27092,234 SYS 24604 Unlimited lives

West Bank (*Gremlin Graphics*) POKE 12713, 165 SYS
4100 Unlimited lives

Whirlynurd (*US Gold*) POKE 17201,250 SYS 16384
Unlimited lives

Who Dares Wins II (*Alligata*) POKE 5702,250 POKE
5513,250 SYS 16384 Unlimited lives

Willow Pattern (*Firebird*) POKE 39855,234 POKE
39856,234 SYS 2304 Unlimited lives

Wizards Lair (*Bubble Bus*) POKE 32354,250 SYS
49328 Unlimited lives

Wonderboy (*Activision*) 2676,234 POKE 2677,234
POKE 2678,234 SYS 2112 Unlimited lives

Z (*Rino*) POKE 2440,250 SYS 2304 Unlimited lives
Zodiac (*Antrog*) POKE 4587, 96 SYS 16896

Zynaps (*Hewson*) POKE 37281,255 SYS 32769 255 lives
Zyron's Escape (*Kele Line*) POKE 1591,173 SYS 4166
Unlimited lives

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The light pen

by Inkwell Systems

a review by Eric Holroyd

I'D NEVER USED a light pen before and when the opportunity came up to check out the Inkwell unit I welcomed it. I knew the Inkwell company of course as the people who published the excellent *Flexidraw* system — a very powerful drawing/drafting piece of software which allows you to use almost any input device and produce anything from a simple sketch to a highly detailed technical drawing.

The Light Pen they produce is compatible with the *Flexidraw* package and of the same perceived high quality.

The unit is sold "for use with Commodore and other personal computers" and is compatible with 64, 64C, SX64 & C128 CBM micros, and may be used in place of a 2-button mouse for input.

After reviewing the Animation Station and discovering that its software (the *Design Lab*) is so similar to *Blazing Paddles* I would imagine that the Light Pen would work OK with that program too.

The Pen itself is nice to use, just point at the screen and touch the switch to draw or operate whatever it is that you've selected. It's quick and easy, a bit like using the Amiga mouse, but particularly good when using one of the drawing programs.

The non-copy-protected demonstration disk that comes with the Light Pen has a backup on the reverse anyway, but the nice manual suggests that you make a backup before using it. There are some good demos on the disk, starting with a Synthesizer program that lets you change sliding switches to vary the sounds being produced by the Synthesizer.

"You don't have to actually touch the screen to get the Light Pen to operate."

A good way to learn more about the good old SID chip and the way it produces synthesized sound together with a good illustration of one of the uses of the Light Pen.

Next on the menu is the Light Pen Piano. This puts a one-octave keyboard on the screen and offers you choices of waveform before you "play" the keys by pointing the Light Pen at the screen. Another good sound "tutorial" and a nice little demo of how to use a Light Pen for input and control.

It was here that I finally realised that

There's a long list of drawing programs with which you may use the Light Pen. Including the following:

Flexidraw, *Flexifont*, *Graphics Integrator* (all by Inkwell Systems)
Cadpak 64, *Cadpak 128* (by Abacus Software)
Micro Illustrator (by Tech Sketch Inc)
Picasso's Revenge (by Progressive Peripherals & Software)
Geos (by Berkeley Softworks)
Prospectives II and *Flexi-Aided Design* (by Kira Corp)
Blazing Paddles (by Baudville)

you don't have to actually touch the screen to get the Light Pen to operate things for you. The "piano" keys were playable from a distance of around 18" (almost half a meter) by just holding the Light Pen and pointing it. Again, a good demonstration of the possibilities of the unit.

After that I came to the game called "Follow Me", which turned out to be a

"Simon" game whereby a sequence of coloured squares flash and musical tones sound. You then have to emulate what the thing's just done and if successful you get a "good" message and the game gives you a more difficult sequence to emulate. It can get quite hard and is a really cute game, made very easy to handle by use of the Light Pen.

There's one more item on the menu (apart from Quit) which is simply called "Where Am I" and it puts the X and Y co-ordinates on the screen for whatever position you point the Light Pen at. Very useful for plotting screen positions for programs. If you are a programmer you're well catered for in this manual as all is explained about how to use the Light Pen in your own stuff. The various demos are written in Basic for your convenience and understanding of what's what. Hardware requirements are explained, also the memory locations of registers used by the unit for X and Y positioning.

If like me, you've never tried a Light Pen before then you're in for a pleasant surprise. I've checked around a few friends and found that they're divided in their opinions of the instrument. Some

like the idea of using a Light Pen for input, some don't like it. By dint of asking a few pointed questions about price paid for the unit used it seems that the ones who didn't like it were the ones who'd bought an "El Cheapo" unit. The moral appears to be once again: You only get what you pay for and you need to get a good

quality unit such as this one to get the right results. Ask for a demonstration of The Light Pen by Inkwell (the distributor would tell you who is your nearest stockist), and see how you like it yourself.

The Light Pen by Inkwell Systems, RRP \$119 at good computer shops. Distributed in Australia by Computermate Products (02) 457-8118. ■

Don't miss out on these great bargains!

Australian Commodore Review Disk Mags Nos 1 to 9

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Disk Magazine Five \$10 Utilities for using Newsroom on an MPS 802 plus printing disk cover with directories, writing signs, printing Doodle and Printshop pictures and more all on the MPS 802! A demonstration of games in the future <i>And More...</i>	Disk Magazine Six : \$12 <table style="width: 100%;"> <tr> <td>Games: Bert the Bug</td><td>Home Inventory</td></tr> <tr> <td>Hangman</td><td>Graphics: Light Fantastic</td></tr> <tr> <td>Demos: Amiga Pharoah</td><td>Utilities:</td></tr> <tr> <td>Space Harrier, Max Headroom</td><td>1571 Utility</td></tr> <tr> <td>The Pacer, Sade</td><td>Disk Filer</td></tr> <tr> <td></td><td style="text-align: right;">DIR@828</td></tr> <tr> <td></td><td style="text-align: right;"><i>And More...</i></td></tr> </table>	Games: Bert the Bug	Home Inventory	Hangman	Graphics: Light Fantastic	Demos: Amiga Pharoah	Utilities:	Space Harrier, Max Headroom	1571 Utility	The Pacer, Sade	Disk Filer		DIR@828		<i>And More...</i>
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Disk Magazine No 7 \$12 Utilities: Anti-Isepic, Sledgehammer, Fast Format, Renumber, PS/PM/NR, PS Printer, Graphics Editor. Other: Joystick Tester, Irish Jokes, Converter, Ultimate Writer, Home Finance, Oscilloscope, Dice Roller, Chord Maker, Dark Forest, Don Martin, Funny, Music Classics. Demos: Karate Kid II, Thrust Concert, 3D Demo, and more. For 128: Bootmaker 128/64 Utility, Convert Basics utility.	Disk Magazine No 8 \$12 Utilities Track and Sector, Function Keys, Unscratched, Relocatable directory, Tape Rename Home/Business Calendars, Chequewriter, Screen clock Graphics ESCOS version 2.99, Newsroom Camera, Clear Screen, Future Writer, Demos, Enterprise II, Eddie Murphy Games A super special for issue 8.														
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Part 6

In Part Six of his regular tutorials on Machine Code, Andrew Baines looks at a little known mode on the '64, Binary Coded Decimal.

Machine code tutorial

WHAT IS Binary Coded Decimal? In normal binary, on eight bit computers, all eight bits are used to store one number. That number may vary from one to three digits in length, eg, 0 and 255. This is the most widely used mode on the 65XX series. But it is also one of the most difficult to print in decimal, as each digit has to be found by division. Obviously, this is not one of the best methods to use when speed is required - eg, an interrupt-driven clock. Using BASIC's floating point routines to divide a binary number into decimal digits while interrupting the computer would not make you the most popular person on the block - programs would crash left, right and centre.

What then, could be used in regular binary's place? What we need is a method of storing digits of numbers, not whole numbers by themselves, so that each set of bits holds a digit of one number. As in all alternate methods, there is a trade-off. Memory is the loser, while speed and reliability are the winners.

Binary Coded Decimal uses four bits to store one digit of one number. Then the other four bits of the byte are used for storing the next digit, and so on. So, one byte can now hold from zero through to ninety-nine. Zero would be 0000 0000 in Binary Coded Decimal (BCD from now on), and Ninety-nine 1001 1001. Observant readers would have noticed that the two digits are simply nine's in binary. Please realise that 1001 1001 in normal binary is different - it is 153, not 99.

However, conversion to BCD format is very easy. If we had the number 43 (decimal), and wanted to use it in our program, all we have to do is put a '\$' in

front of it, and it is converted to BCD format.

About now, problems arise. Since there are sixteen different digits available in four bits (normally we use 0-9 and A-F), and we only require ten (0-9), what happens to the other six? Well, thanks to Commodore's wonderful R & D section, we don't have to worry about this, as the 65XX handles this all by itself.

To turn BCD format on, we use the SED instruction, SEt Decimal mode, and to turn BCD off, CLD, CLear Decimal mode.

Addition

So, a BCD addition would look like this:

ADDITION CLC ; CLear the Carry flag, ready for an addition.

SED ; SEt Decimal mode. Go into BCD format.

LDA #\$56 ; LoAD the Accumulator with the BCD value 56. This is the decimal equivalent of the value loaded into memory. Simply put a dollar sign in front of the decimal number, and you're away, no conversion hassles!

ADC #\$10 ; Add with Carry the value 10 to the Accumulator. Once again, very easy.

STA RESULT ; STore the Accumulator in the location labelled RESULT.

BCC END ; Now we check the Carry flag, to make sure the accumulator holds no more than ninety-nine. If it has overflowed, the carry will be set, if not then the carry will be clear. Branch on Carry Clear to END.

LDA RESULT+1 ; Normally, an INCrement instruction would have fitted nicely here, but since it doesn't adjust the operator to account for BCD format

correctly, we can't use it or DECrement.

ADC #\$00 ; Add 0 to the Accumulator with Carry. Since the Carry holds one, this is no problem.

STA RESULT+1 ; STore the Accumulator in the memory location RESULT+1.

END RTS ; ReTurn from Subroutine.

Subtraction

Subtractions are just as easy: SUBTRACTION SED ; SEt Decimal mode.

SEC ; SEt the Carry flag to indicate a no borrow situation.

LDA #\$52 ; LoAD the Accumulator with the decimal value 52.

SBC #\$24 ; SuBtract the value 24 (decimal) from the Accumulator. The accumulator now holds 52-24=28.

STA LOWBYTE ; STore the Accumulator in the location LOWBYTE.

LDA #\$98 ; LoAD the Accumulator with the decimal value 98.

SBC #\$13 ; SuBtract 13 from the accumulator. 98-13=85.

STA HIGHBYTE ; STore the Accumulator in the location HIGHBYTE.

RTS ; ReTurn from Subroutine.

We just subtracted the number 1324 from 9852, painlessly and quickly, and the whole process is visible, no messy conversions to and from decimal are needed, as all numbers are in decimal.

Binary Coded Decimal is not one of the most widely used modes on the '64, but it has its uses.

The last few arithmetic instructions are ASL, BIT, LSR, ROL, and ROR.

ASL - Arithmetic Shift Left. This operates on the accumulator if there is no address after it, or on a memory location

if there is an address after it. It moves all the bits in the Accumulator/memory location to the left, dropping the seventh bit off the end into the carry flag, and placing a zero in bit zero. ASL effectively doubles the number contained in the Accumulator/memory location.

Example:

ASL.EG LDA #30; Load the Accumulator with the value 30. In this example, we are going to double the value of 30.

ASL ; Arithmetic Shift Left - effectively doubles accumulator

STA DOUBLE ; Store the Accumulator, now holding 60, in the location double.

ASL DOUBLE ; Arithmetic Shift

Left on memory location

DOUBLE. Doubles DOUBLE, making it 120.

RTS ReTurn from Subroutine.

BIT - Compare memory bits with Accumulator. Bit performs a logical AND between the Accumulator and a specified memory location. The result is not left in the accumulator, it is intact,

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as is the memory location. The result of a BIT operation appears in the zero flag. If $Z = 0$ then the operation was successful, $Z = 1$ if it failed. Also, the Overflow and Negative flags are loaded with the memory location's sixth and seventh bits respectively.

BIT. EG LDA #128 ; Load the Accumulator with the value 128. This sets the seventh bit of the accumulator.

STA 49152 ; Store the Accumulator in the memory location 49152. BIT can only operate on the accumulator and a memory location, making it necessary to store the number we want to use against the accumulator in memory.

BIT 49152 ; compare memory BITs with accumulator. As the accumulator holds the same number as 49152, the result will be true, $Z = 0$, $V = 0$ as bit six of 49152 was clear, and $N = 1$ as bit seven of 49152 is set.

LDA #64 ; Load the Accumulator with the value 64.

BIT 49152 ; compare memory BITs with accumulator - $128 \text{ AND } 64 = 0$ - the operation failed, $Z = 1$, $V = 0$, $N = 1$, as the sixth bit of 49152 is clear, and the seventh bit set.

RTS ; ReTurn from Subroutine.

LSR - Logical Shift Right. This instruction is the exact opposite of the ASL instruction. The Accumulator (or memory location) is moved right, forcing the zero bit into the carry, and putting a zero into the seventh bit.

LSR. EG LDA #128 ; Load the Accumulator with the value 128. In this operation, we will halve 128 twice.

LSR ; Logical Shift Right = $128/2 = 64$. The accumulator now holds 64.

STA HALF ; Store the Accumulator in the memory location HALF.

LSR HALF ; Logical Shift Right of the contents of HALF. Divide HALF by two - $64/2 = 32$.

LDA HALF ; Load the Accumulator with the memory location HALF.

JSR \$FFD2 ; This is one of the KERNAL routines you will use most often. It prints the ASCII character in the accumulator to the screen. Therefore, a

space will appear on the screen after this routine is executed.

RTS ; ReTurn from Subroutine.

ROL and ROR are very similar, in that they perform the same operation: the only difference being one does it in the opposite direction to the other.

ROL - Rotate Left one bit - moves all bits one to the left, placing the contents of the carry flag into bit zero, and placing the contents of bit seven into the carry.

ROR - Rotate Right one bit - moves the bits one to the right, placing the contents of the carry flag into bit seven, and the contents of bit zero into the carry. Note that on some very old 6502s, ROR does not exist. This shouldn't be a problem, because C64s have 6510s in them, and C128s have 8502s in them.

ROR. ROL. EG LDA #128 ; Load the Accumulator with the value 128. We are going to add 64 to this.

SEC ; Set the Carry flag. This will go into the seventh bit of the accumulator.

ROR ; Rotate Right the contents of the accumulator. The accumulator's sixth and seventh bits are now set, as the seventh became the sixth, and the carry became the seventh. $128+64=192$. The accumulator now holds 192.

STA 49152 ; Store the Accumulator in the memory location 49152.

ROL 49152 ; Rotate Left the contents of memory location 49152. As the Carry was clear from the last operation (it held bit zero, which was clear), 49152 now holds 128, and the Carry is set again.

RTS ; ReTurn from Subroutine.

Multiplication

Multiplication is very easy. All we have to do is add one operator to itself the number of times the other operator states. Eg: $5*3$. We add $5+5+5=15$.

MULTIPLY LDX MULTD ; Load the X register with the multiplicand. LDA #0 ; Load the Accumulator with the value (#) zero. CLC ; Clear the Carry flag, ready for an addition. We only

have to do this once, as this routine can only be used for operations that don't give an answer above 255.

LOOP ADC MULTR ; Add the Accumulator to MULTR, leaving the result in the Accumulator.

DEX ; DEcrement the X register.

BNE LOOP ; If the X register is not zero, do again.

RTS ; ReTurn from Subroutine.

There are other ways of multiplying two numbers together, but that is the most basic, as it doesn't test whether or not the answer is larger than 255. Next month, we'll start looking at Floating Point routines, these are much easier to work with, and they're already in memory!

Transfer instructions

Wouldn't it be nice to be able to copy one register to another! Well, there is a way of doing it - transfer instructions.

These useful little instructions copy all of one register into another. For instance, TAX means Transfer the Accumulator to the X register. If the accumulator held \$82, the X register would now hold \$82. The accumulator would be unchanged, only the X register changes.

There are several transfer instructions, they are listed below:

TAX - Transfer the Accumulator to the X register

TAY - Transfer the Accumulator to the Y register

TSX - Transfer the Stack Pointer to the X register

TXA - Transfer the X register to the Accumulator

TXS - Transfer the X register to the Stack Pointer

TYA - Transfer the Y register to the Accumulator

Finally, if you have any suggestions for programs or questions about machine code, don't send them to the main cave in Sydney, they'll most likely never get to me. Send them to:

Andrew Baines
18 Roma Avenue,
Wallacia N.S.W. 2750. ■

Adventurer's Realm

by Michael Spiteri

BONGIORNO, adventurers. Welcome to the Realm!

This month I've given you reviews of many adventure games ranging from the graphically superb *Jinxter*, through to the textually tantalizing *Paradox Effect II* (exclusive preview.). Our maze debate finally gets under way with some strong arguments from both sides. We also have some disastrous news from Infocom.

The correspondence department

THERE ARE millions of reasons to write to the Realm. You could be asking for help, you could be giving help, or you could be expressing your views on anything adventurous. You could be debating the debate or just in the mood for a chit-chat. The famous address to write to is:

**Adventurer's Realm
1/10 Rhoden Court
North Dandenong
Victoria 3175**

Don't forget to include a return stamp.

If you ask for hint sheets, you'll probably receive them within the week, otherwise, standard reply time is 2-3 weeks from when I receive your letter.

The following FREE hint sheets are available: *Zork 1,2,3*, *The Hobbit*, *Lord of The Rings*, *Hampstead Hitchhikers Guide*, *Castle of Terror*, *Never Ending Story PII*. ■

The wargame department

NOW FULLY operational. Any problems/comments/hints regarding war-games should be sent to the Realm (Attn: WarGames Section) and Barry Bolitho will do his best to cater for your needs. ■



The RolePlaying department

We are working on this one. At the moment we'll try and publish your role-playing problems/tips, until we can find someone to take lead of this section.

Infocom finally dies in Australia

IT WAS INEVITABLE. It had to happen. Imagineering's game department, Questor are no longer importing Infocom games from the States. Although I haven't been given a reason, it is probably due to lack of orders on the retailers part. This probably means that *Beyond Zork* and *BorderZone* (as well as *Plundered Hearts*, *Stationfall*, *Nord & Bert* etc) will never be seen here except in pirates' hands. You can order direct from the States if you wish. Don't lose hope yet!

We will try and track down a suitable method of getting Infocom games to you. Watch this space. ■



Adventurer's Realm super functions

THE NSW Help Booth is still in its planning stages. We are still having problems finding a suitable location. It will probably run for 2-3 days.

The Victoria Help Booth is now closed. Time has run out - we hope Melbournians found it useful.

The latest super Realm function is the Australian 1st Adventure Convention - a weekend where adventurers will meet/discuss/play adventure games. Non-profit, non-pirate event. Just an idea at the moment, send me your views and suggestions. ■

New Products



QUESTOR, the leisure dept of Imagineering, have a complete range of new adventure/strategy games on their list. These include:

Romantic Encounters at the Dome, where the player enters a futuristic hi-tech singles club complete with parties, people, dancing, love testing and many interesting situations to get yourself into. The author is a famous screenwriter & psychologist. An adults-only game for the Amiga and C64.

Then there is the more family-like *Land of Legends*, a new fantasy game which gives the player

the task of defending a kingdom which is plagued by evil beings. This is the first in the Questmaster series. Both games are by MicroIllusions software, distributed by Questor.

Questor also stock Infocom hint books for *Leather Goddesses of Phobos* and for *Hitchhikers Guide to the Galaxy*. These retail for only \$20.

Other adventure games available from Questor include *Faery Tale* (\$50), *Jinxter* (\$60), *Jewels of Darkness* (\$50), *Guild of Thieves* (\$60) and *Ultima IV* (\$50). (Prices based on C64 software. All software also available for extra cost on the Amiga).■

Help for many a troubled adventurer

Game: *The Pawn*

For: Suzanne Parkes

From: Mr M. Morris

Help: The pedestal is north of the lava river. To get past this, go to the lava river, drop everything, climb up the hole in the ceiling and break the wall. Then go east, pick everything up and go north. Move the pedestal, look inside the niche, get the blue key, free the princess or open the safe in the tree.

Game: *The Helm*

For: ANYBODY.

From: Edward Davis

Help: To find a needle in the haystack, find a lens to start a fire!

Game: *ZZZZZZ*

For: ANYBODY.

From: Edward Davis

Help: Fire the gun at the duck, take the balloon, go west to the exit and open it.

Game: *Labyrinth*

For: David Newman

From: Ian Ross

Help: Before you can rescue LUDO

you must get rid of the two guards. To do this you need to change the colour of the coloured squares to red. Do this by walking across them three times. You then have to get the guards to cross a red square, but in doing so you must be careful not to cross a red square yourself. When both guards have been eliminated you can free Ludo by using one of the items which you are carrying.

Game: *Maniac Mansion*

For: ANYBODY.

From: Rob

(MS: *Could I have your address*

please?)

Help: a) Leave one kid at the mailbox to pick up the parcel. b) To open the grating behind the bushes, use hunk-o-matic machine. c) To get past the tentacle, feed it wax fruit + fruit drinks. d) The dimes are needed for the telescope. e) To get radio in pool, get one character in basement and open water valve and another at the pool. But hurry.

Game: *Bards Tale I*

For: Jim Fang

From: Alister Cairns (alias ALF)

Help: Kill the golem. You will probably lose a character in the attempt unless he has a master sorcerer in his party who can conjure a storm giant or dragon.

Game: *Bards Tale I*

For: ANYBODY.

From: Alf

Help: The 400 berserkers were easy to kill but the eight mandar guards in the slave quarters were very hard to kill with considerable losses. They can be found on the second level of Harkyn's Castle.■



Demented and troubled adventurers

Everyone seems to be stuck in an adventure game this month. If you think you can help any of these dudes, write to the Realm - as soon as you can!

PLEASE HELP, writes Richard Chan of Banksia, NSW. He is stuck in *Moebius* on an Amiga. Richard is stuck on the Powers of the Mind section. Can anyone out there help??

Gary Bau of Yinnar Sth, Vic, is stuck in a few games.

In *Price of Majick*, where does he find the crystal ball and the staff? In *Gnome Ranger*, what does he give the Gnymph to calm her down? In *4th Protocol*,

a) what does he do about Pasternak when I discover that he is Johnstons contact?

b) Who stole Nato papers?

c) How can Building 17 be

Once Man Alive

Now Living Death

It Drinketh Blood

N' Staple Breath

Complaints Department

"*The Bards Tale*. How do I keep awake playing this game? Graphics are poor, text is always the same and action is so repetitive. The dungeons look like the dividers in a ladies bodoir - and for this I had to pay money? *Ultima IV* is not much better and *Mercenary* is another hour of boredom! My whinge is that you have to lay out a lot of money and you don't know what you are going to get for it. You have to buy all these games on the deception of the packing. I have more games like this, and every one was quite expensive."

MS: Many magazines review games. I suggest you read some of these first. Also, ask for a demonstration. If the shop won't give you a demo, go somewhere else. Any store that doesn't offer such a service shouldn't be selling games in the first place.

Jinxter

On disk for the Commodore 64 and Amiga

ALL I CAN SAY is that in the few hours I played this game, didn't see any of these charms. What I did get to see was a raging bull and an arrogant post-man called Lebling (ring a bell?! I went to pay a visit to my ol chum Xam but he wasn't there. Anyhow, I think I've given you a fair idea of the plot - but what about playing the game?

The vocabulary and parser are excellent - I must admit that! Full sentences can be entered and understood like a breeze. A great improvement on *The Pawn*. However - the graphics are not.

The graphics on the C64, although absolutely bursting with colour, are sometimes unclear and a bit too chunky, and at times, I found it an eyeshore to work out a picture. Still, they are fairly

advanced and supplement the game quite well.

Graphics on the Amiga version, however, were excellent. More detail and more clarity that its predecessors, and a pleasure to view.

The text descriptions were all in cockney English. If you can't stand this type of talk, then don't touch this game, because

you won't play past the first screen. Nevertheless, the text is very amusing and witty with the occasional send-up of Infocom thrown in.

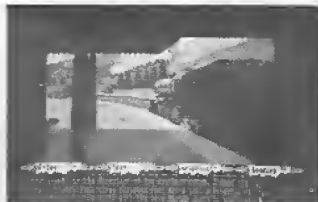
As well as the disks, you also receive a copy of the *Independent Guardian* - a newspaper packed with hilarious stories, and many hidden hints as well as the usual coded clues. This newspaper is essential if you are to complete the game

as the hidden clues are just too vital. Also, the game occasionally asks you to type in a word from the newspaper for the sake of preventing piracy.

You also get a beermat (with a competition on the back.) and the previously mentioned *Department of Guardians* document.

Jinxter is a very good program, with no particular adventurer in mind - since the problems range from easy to very hard. It is a humorous game and a joy to play.

VERDICT: Quite playable - but ask for demo before purchasing! ■



Price: C64 - \$59.95
AMIGA - \$69.95
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Scrolls/Rainbird
Distributed by: Questor
(Imagineering) (02) 662 7944

Sneak Preview

Paradox Effect II

For the Commodore Amiga

Hot on the trail of *Paradox Effect* (reviewed March issue) comes along its sequel. I received a pre-production version, with the documentation on an IBM PC disk. Unfortunately I didn't have time to get the documentation printed out, so I was playing blind.

In *Paradox Effect*, you played the character Qume who was asked by another character called John to go back in time and prevent Qume's birth from being aborted. (Qume, you see, had invented a time machine, and another fellow wanted all the credit so he went back in

time to prevent Qume being born. What he didn't realise is that without Qume being born, the machine cannot be invented.)

In *Paradox Effect II*, Qume has completed his task but his trip home has been stalled for some obscure reason. So a few other problems have to be solved before he can go home. Many revelations occur in this sequel - for instance, we actually discover who John the ol' fella really is.

Paradox Effect II is a true science-fiction space text adventure. 100% Aus-

tralian made, and a lot more like an Infocom game than its predecessor. The parser is excellent, the vocabulary is a bit better and the text descriptions are not only detailed, but also very humorous. The screen display is much clearer with a good choice of colours selected.

A great improvement on *Paradox Effect I*, this game should provide adequate enjoyment to all who play it. I wonder when *Paradox III* will be released?

Vocabulary: 93% Parser: 92%
Plot: 90% Overall: 90%
VERDICT: Another Aussie wonder.

War Games

Conflict 1 & Conflict 2

from SLM

reviews by Barry Bolitho

The *Conflict* games packs contain not so new simulations, but each pack is good value. The good news is that Australian companies keep getting stronger with advantage to us in dollar value against expensive imported games.

Also, you are reading this review in an Aussie magazine. There is a message there somewhere.

Conflict 1

Conflict 1, from Melbourne House is a compilation of three strategy games. These re-releases are well packaged & presented in a video cassette size box. Not only does it look good on the shelf, but contains three interesting simulations, all on disk.

Battle of Britain

Battle of Britain, *Theatre Europe*, and *Falklands 82* make up the roster.

Battle of Britain puts you, as fighter command RAF against the computer

Luftwaffe. Two optional arcade segments are a bit of fun for shoot em up fans, but are not recommended for the campaign game. All commands and information are operated through the joystick, with the exception of the radar screen.

The joystick controls a command box which when placed over a unit will give you that unit's status. If the unit is an RAF squadron, orders can then be given to scramble, attack, or land and refuel. Scenarios are training, campaign & Blitzkreig. The latter scenario will test your command ability to the full, as the computer throws wave after wave of enemy aircraft at you.

The campaign game is my favourite; this lasts for thirty days and is fought one day at a time. This brings into play elements such as pilot fatigue, reinforcements, weather and radar. Your objective is to defend the area of Southern England shown on the screen by doing as much damage to the enemy as possible, while keeping fighter command intact. Enemy

raids are picked up on your valuable radar, but composition of each raid will not be known until it crosses the English coast.

Then the observer corps gives you the number of fighters and bombers in the raid. You control 18 fighter squadrons operating from 9 airfields and you must defend these airfields, 13 radar stations & 15 towns or cities. Good luck.

This game will keep you thinking as enemy action, bad weather and fuel shortages all take their toll. Easy to learn, but not so easy to win.

A game save option is an essential tool for the campaign game; it is also useful for a game save before experimenting with different strategies.

This is a good game on the first battle fought and decided solely by airpower.

Theatre Europe

When *Theatre Europe* was first released, it created quite a controversy. Any simulation with a nuclear option would

tend to make a lot of people object to its subject matter. WW III in Europe, even if it stayed conventional, would be horrific. Add to this bacteriological and nuclear options, and mankind's worst nightmares would be upon us.

Theatre Europe is an anti-wargame, as you will discover should you play it. This simulation places you in command of either NATO or Warsaw pact forces. The computer always plays the other side. Joystick command box control as in *Battle of Britain* makes game play fast and simple.

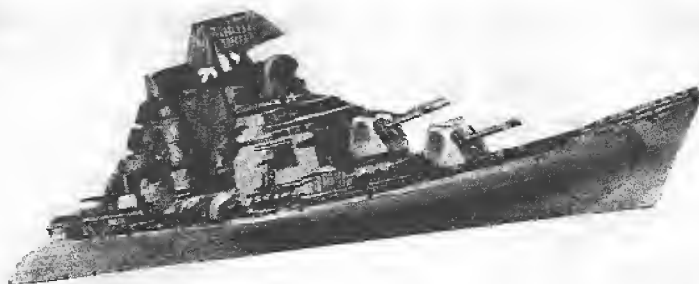
The scenario postulates a conventional attack into West Germany by Warsaw pact forces. The objective is to seize as much of West Germany as possible within thirty days. As NATO is outnumbered three to one in Europe, they must fight a careful defensive battle utilising their air power assets to their best advantage. The battle on the ground is somewhat overshadowed by the air combat above. Each side must make the best use of their available air power in a variety of missions.

Some missions are: air superiority, interdiction and iron snake (attacks on railways to limit supply and reinforcements.)

Strike breaker is nothing to do with the union movement; this is a mission reminiscent to Stuka attacks on a obstinate unit as in the Blitzkrieg. Recon'air missions will give the strength of enemy units if enough aircraft are assigned to that role.

The nasty stuff begins with local gas attacks used by an attacker to assist in overcoming the units being attacked. When biological or nuclear options are requested, the warcomp teletype comes on line in the form of teletype chatty but rather chilling messages.

If you push the nuclear button you are requested to enter a code phrase to obtain release of nuclear weapons. Type in the code and you will get four options:



failsafe, standby, limited strike, and the big bang. A reflex system can be turned on. This means an automatic retaliation to a nuclear strike. On the top right of the display is a Defcon condition number, that lets you know how close to armageddon you are. Defcon 2 is not a good number to be on.

Eventually one side will fire a nuclear missile and the graphics, sound, and visual result are frighteningly spectacular.

I showed this program to Mike Spite-ri to get his reaction. We were using a green screen monitor without any sound effects so a lot of impact was lost. However, I got his undivided attention for a while, he even forgot about mapping adventures for a little bit. We even had a quick bash at OGRE, and we might get him wargaming yet.

Theatre Europe should be seen on a colour monitor to get its full - rather eerie effect. What does spring to mind, is the comment made by the WOPR computer in the film *War Games*. "The only way to win is not to play." Very relevant remark when applied to potential nuclear war.

The victory conditions are to achieve your territorial goals without escalating the conflict to the point where you lose control of the situation. If you lose it, you can sit helplessly in front of the computer as both NATO and the Warsaw pact, as well as Western Europe, disappear under mushroom clouds. The teletype will come back on line to wish you and civilisation a sad goodbye before slipping into oblivion.

Definitely a must for all wargamers and anti wargamers alike.

Falklands 82

We have a more recent piece of history for the third game in this pack. *Falklands 82*, or the Empire Strikes Back as it is sub-titled. Most of us watched this conflict between Great Britain and

Argentina for the Falkland (Malvinas) Islands almost, it seems, yesterday. Now we have a simulation that recreates that battle.

The graphics are just adequate, and the screen display only functional. If you like complicated high res etceteras, you probably will not be too impressed. However, the game plays well.

Harriers beat off enemy air strikes and supply ground support. Warships from the task force provide gunfire support, and without air and naval support, it's not an easy job to retake the islands.

The computer plays the Argentinians and several degrees of optional difficulties will make them formidable opponents. Units are given all commands through the keyboard, so put away the joystick for this one.

Your aim is to liberate all the settlements by landing at one of a number of beaches. Argentinian forces are hidden and will not appear until a Brit unit moves into range, or the Argentinean unit fires.

SAS and SBS units are available to recon beaches for possible invasion, and they will find and expose hidden Argentinean units.

This simulation is very similar to both *Okinawa* and *Iwo Jima*, they are simple, fast games to play.

Conflict 1 is good value, it has a wide historical variety in its three simulations. It starts with one of the most interesting and crucial battles of our past, moves up to our most recent piece of military history, and if you are not careful, can finish with a bang.

Conflict 2

Conflict 2 could be called the Pacific

pack. The three simulations included, again on disk, are three of the major battles fought in that theatre of war in WW 11.

We have three invasions; one failed attempt by the Japanese, and two successes by the Americans. These are *Midway*, *Okinawa* and *Iwo Jima*.

Having seen John Wayne in the movie about Iwo Jima, I charged into that one first. I now know why this game is sub titled the marines' hardest fight.

The crafty Japanese computer gave me a lesson on tactics that had me swimming back to the fleet. So much for slap happy play testing ! Getting a bit more serious, I had another bash, and restored my dignity.

Okinawa is easier going. There are more invasion beaches and far more options for the invader. Both simulations are US Forces versus the Japanese computer.

The Japanese forces take position randomly and invisibly each game. They are not revealed until a US unit moves within range, or they open fire. Japanese submarines lurk around both islands, attacking the fleet and so reducing naval gunfire support.

US carrier strikes arrive in good weather, but bad weather can delay reinforcements.

As the games are usually fast to play, there is no game save option. Both *Okinawa* and *Iwo Jima* are almost identical in game play mechanics. Tactics however are quite different. Visually, these games are on a par with *Falklands 82*, and back in my board game days would be referred to as beer and pretzels games. If this means they are fast, easy to learn, interesting and challenging games, then that is a good term for them. They are a must in my library.

Midway was the battle that curtailed the almost unstoppable Japanese push Southwards. It was the battle that US Forces most needed to win at that time.

After the Midway battle, and the loss of four fleet carriers, Japanese options were so reduced that they were forced to

fight a war of attrition that eventually exhausted them. This simulation of that battle pits your command skills once again against a Japanese computer opponent.

Three levels, with fast or slow game-play increase the command pressure as play gets faster. Level one gets you familiar with the joystick controlled command box order mechanics.

In part one the paths of the three enemy task forces are marked on the battle screen, fish in a barrel.

Part two follows the historical battle as you manoeuvre two US task forces of three carriers against a superior enemy fleet.

Midway and Carrier based recon aircraft are your eyes and the key to victory as you seek out the three task forces bearing down on Midway island. Orders to launch and recover air strikes are issued through the com box task force movements and intelligence gathering works the same way. There is a wealth of information in this game.

Placing the com box over a Japanese fleet symbol and pressing R will give you a bird's eye view of the Japanese ships as seen through the clouds. This is essential as the Japanese carriers must be priority one target; airstrikes against the invasion force are a waste.



Surface gun action is possible either against Midway or either of your task forces that bump into the Japanese during the night. Your target is to sink all four fleet carriers of the first mobile fleet. If they are sent down the gurgler then the main body, and the Midway invasion force will retire west at best speed.

Victory is acknowledged by a screen depicting the raising of the flag and playing the national anthem of the victorious nation.

As a bonus it is possible to sink the



carrier attached to the main body before it nicks off. This will make it one more carrier than was sunk in the real battle.

The Battle of Midway was an offensive operation initiated by the Japanese. Its dual purpose was to occupy Midway island base, and to lure the US carriers into a fleet action so they could be destroyed. This done, the entire west coast of America would be wide open to any action the Japanese felt like. Clever code breaking and intelligence work on the part of the U.S.N. forewarned the Americans. In a bold gesture, the Americans risked all to ambush the Imperial Japanese Navy at Midway. Fortunately, the gamble paid off.

Level three of this game postulates that the Japanese knew the US knew their plan. This time the enemy knows you are coming and is waiting. If you like a bit of a challenge, then this is for you.

There are more than the four carriers present, but I am not telling how many. Should you like to research the battle, read Walter Lord's book *Incredible Victory*.

Playing at this level I heard the "Star Spangled Banner" played only once, and it cost me all three American carriers to do it.

There are arcade sections in the game, air strikes on ships and Midway Island, night surface gun action, and bombardment of Midway Island.

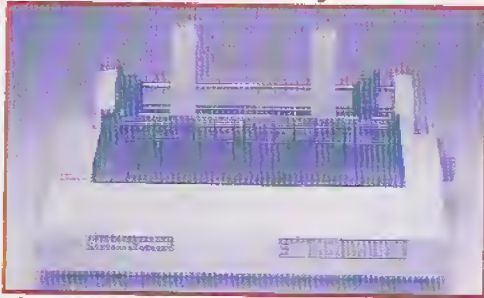
Good joystick action either to shoot down attacking aircraft or engage surface targets. The action screens are obligatory, but fit in well and add to the flavour of the game. *Midway* has the luxury of a game save option, and is one of the best strategy games available. It is worth buying *Conflict 2* for *Midway* alone, what a bonus with another two games as well.

Both *Conflict 1* and *Conflict 2* provide an interesting range of strategy simulations that should appeal to all strategy wargamers. But watch out on your first attempt to take Iwo Jima. ■

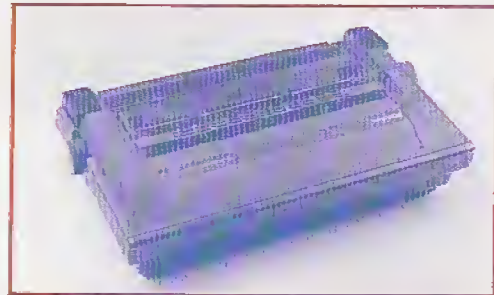
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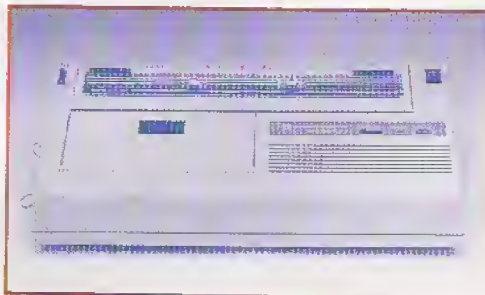
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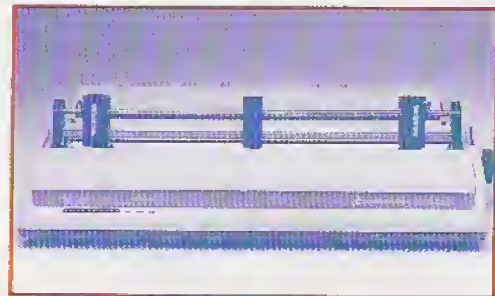
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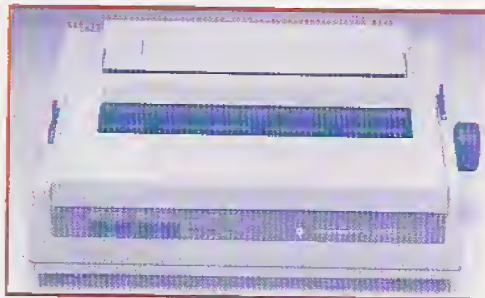
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